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Hutchinson, Kansas, Now Enjoys Motorized Transfer Service

Experience Has Taught Transfer Men in This Town the Superiority of Motor Trucks Even in Short-Haul Work. People Favor It Because of Better Service. Transfer Men in Other Cities Should Profit by the Experience of Hutchinson

A GREAT number of transfer men still believe in the advantage of horses over motor trucks in their particular work. Either they have not had enough experience with trucks to teach them their superiority, or they have been unfortunate in their selection.

Short hauls and long stops are the arguments most frequently given to prove that the truck is not economical in city transfer work. The time is fast coming when these will no longer stand. All over the country the truck is proving itself much more preferable to horses in short-haul work. When a man tells you the truck is too expensive in short-haul service you can safely judge him to be basing his opinion upon the old standards which time and service have changed.

Nor is the motor truck in transfer service restricted to the larger cities where it would necessarily get longer runs. It is giving excellent service in Hutchinson, Kans., a town of 20,000. Its superiority has caused all the larger transfer companies in Hutchinson to motorize their transportation equipment, and every one of them is enjoying an increased business and greater public confidence because of it. The horse has become a thing of the past.

When C. O. Cody first put on a truck in his transfer and delivery business three years ago, the people in the town gave him a great deal of discouragement. But C. O. Cody was a man of his convictions and he believed in the motor truck. He stuck to it and, as a result of his pioneering, he can now mention five other transfer companies in his town who are using trucks successfully. Two of the others have been in the business for 20 and 30 years.

Being a business man, Cody investigated before getting his first truck. He got the cost figures of horse maintenance from several of the other transfer men and secured reasonably accurate figures on the cost of truck operating. These were compared, with the result that the truck showed up to advantage and a 1500-lb. GMC was purchased. Since

then two additional ¾-ton GMC's and a 2-ton Denby have been purchased. The Cody Transfer Co. uses no horses.

The work is varied, and includes freight hauling around town, merchants' delivery, and furniture moving. This work gives the trucks a good test. Mr. Cody claims that in ten hours, one man and a 2-ton truck will do as much work as two double teams, and at half the expense. This is exclusive of the better service rendered the public, which brings in a greater volume of business.

Hauled Apples From Farm in Fall

Last Fall the farmers used the motor truck service of the Cody Transfer Co. in sending their apples to the city for storage. These apples were hauled from points within a 15-mile radius to Hutchinson and the apples were delivered to the storage house in much better condition than when sent by express or freight. The apples were boxed. The ¾-ton GMC's generally made a round trip in 1½ hours, carrying an average of 70 bu. to a load.

The rates charged for this work were graded according to the mileage. Up to 7 miles the cost per bushel was 4 cents. From 7 to 11 miles, 6 cents a bushel was charged, and from 11 to 15 miles, 7 cents. From one orchard 700 bushels were carried to the city in this way.

Selling Truck Service

The Cody Transfer Co. has a contract with three of the big produce houses in the town to deliver to the people and to haul shipments to and from the storage house. The produce companies pay a set amount each week for this service. When the transfer company was first engaged to do the work, it hauled and delivered for two weeks before entering a contract, to determine what would be a reasonable charge. The time and tonnage carried during this period were checked and then a flat rate was offered and the work contracted for. There is a good loading platform at the produce houses, which are across the street from each other, and the packages can all be arranged in the order of their delivery while



The Merchants Transfer & Storage Company Uses No Teams
The three three-ton Reo's, and one one-ton Reo and the Ford take care of more business than the sixteen head of horses once used

loading. At 7.30, 10.30 and 2 o'clock each day the deliveries are made quickly and on time to the satisfaction of the consumer, who knows just when the order will be delivered.

When the roads are in condition, trips are often made to towns within a radius of 60 and 70 miles. Furniture hauling is done to a considerable extent on these long runs and in competition with the railroads. The shipper has assurance that his furniture will be delivered within a certain time. When shipped by rail, if the train gets into the depot after closing time, the shipment must wait until morning before it is unloaded. Then there is the additional time and cost of drayage from the freight depot to the final destination. Charges for this hauling are based on mileage. For the 2-ton Denby the cost is 75 cents a mile, and with the $\frac{3}{4}$ -ton GMC's, 60 cents a mile.

One big feature which makes the use of trucks more necessary in the freight transfer work is the shorter hours at the freight stations. They close at four o'clock now, instead of five. This means that one hour is cut off the transfer man's day, and during the remaining hours he must have some means of getting the same volume of work done. The truck will save the situation because of its ability to work continually to capacity, and because of its greater speed.

People Appreciate Better Service

From the time when trucks were first used in Hutchinson, people began to realize how much better service they gave, and often someone would 'phone the transfer man and ask, "Are you the man who has the trucks? * * * Well, you're the man I want." He got the business. It was the awakening of the people to the benefits of truck service that caused the other transfer companies to give up their horse-drawn equipment.

In furniture moving, where the distance is more than four or five blocks, the trucks give much better service to the public. The men who drive trucks are, as a rule, a higher type than teamsters and do the work faster and better. When the public pays for furniture moving by the hour, as is the rule in Hutchinson, they want the work done by the fastest medium, and of course the truck gets the preference, because even under the most adverse circumstances, the truck will travel at least five times as fast as a loaded team. The truck does the same work in less time for less money than the teams, and the people are better satisfied.

The City Transfer & Storage Co. retains two teams. It asserts that there are instances, such as hauling a load through muddy roads, where trucks can-

not be used. The teams are kept for work of this kind. But, as one of the other transfer men said, when horses are used for such work, the strain on them is very great and it does not pay in the long run.

This company once operated enough teams to keep twenty-one head of horses at work, but it has at the present time only two teams. To take the place of the other horses and wagons there are five trucks: two 2-ton Reos, one 1-ton Republic, one 2-ton Republic, one Form-a-Truck, and two Ford runabouts with little express bodies on the rear. Mr. Willms, of the company, says that the maintenance for the trucks is much less than for the teams.

Comparing Cost Figures

The 2-ton Republic was acquired recently. Two of the double teams were traded in as part payment, \$325 being allowed. When the change was first thought of, the figures for team costs and those for truck costs were compared. The cost of each of the eight horses for a month was divided as follows: hay and grain, \$14.30; light and water \$0.50; stall rent, \$1.50; horse-shoeing and veterinary, \$2.50. This made a total for each horse of \$18.80, or \$37.60 for the team. And the cost of harness, repairs, care of horses and depreciation



Upper Left: A two-ton Denby, operated by the Cody Transfer Company, is shown in front of the storage house at Hutchinson. Upper Right: A one-ton Republic making the rounds in its delivery of freight. Lower Left: A GMC which is under contract to deliver the orders of three produce houses, and is shown here at the loading platform of one of the produce houses. Lower Right: One of the two-ton Reo trucks, with van body for furniture hauling; there is a compartment above the driver's cab, opening into the main body, where dishes and other fragile goods are packed.

on the wagons, barn, etc., were not included. Compared to this, the cost of the trucks the company has been operating average about \$34.40 each per month for the past seven months. And one truck will do as much work as two teams!

"All our future equipment will be trucks," said D. E. Willms. His company is the oldest transfer concern in the town, having been in business for the last 32 years.

Then there is the Merchants Transfer & Storage Co., operating three 2-ton Reos, one 1-ton Reo, and one Ford. All the equipment of this company has been motorized. A. G. Barnett, the president, asserts that if it should become necessary to revert to horse-drawn equipment he would quit the business. He was practically the first exclusive transfer man in Hutchinson to motorize his business. When the exposition and fair was held in Hutchinson, all the hauling to the building was entrusted to his trucks. Indicative of the change the trucks have wrought in the service, the people expect, Mr. Barnett says, that three years ago when a person asked when a load could be hauled, they were satisfied if the company could find time to do it the following day. Now they call on the 'phone, and if they must wait more than a half hour try another company.

Advantage Not Often Considered

Being a progressive man, A. G. Barnett is on the lookout for ways to increase his business, and he believes that one good way is to be prepared to take care of a larger volume of business, when it comes, instead of waiting until it is in sight before preparing. If four trucks are just sufficient to handle all the ordinary work, keep an extra truck for emergency calls. If you are prepared to give the people service on their emergency work, they will eventually come to rely on you for all their service.

It is possible to keep a truck for this purpose when a team would be out of the question. The only cost of the truck when not working is the interest on the investment, while the team adds the cost of feeding and caring for the horses.

It is much easier to get good drivers for trucks than teams. Men object to coming to the stable half an hour early to get the horses in shape for the day's work, when a truck driver can come in a few minutes before starting time, give the engine crank a few turns and is ready to roll out. On Sunday the horses must be looked after. This means that the men who drive must take turns coming to the stable on Sunday to feed, bed and water the horses. If not this, then the company must go to the expense of hiring a hostler for the stable. All these necessary small costs, which seldom enter into the calculations of the horse owner when he hastily decides that the truck is too expensive, really amount to a considerable sum in money, time, and inconvenience during the course of the year.

The Union Transfer Co., which has been in the business for some 20 years,

is using one 2-ton and two $\frac{3}{4}$ -ton GMC's. It has a few teams left of which it is trying to dispose so it can completely motorize its service. Not one of the Hutchinson transfer men had an unfavorable word to say in connection with the performance of the trucks, and practically all of them have experienced a material increase in business in the last two years since they replaced their team service with motor trucks. There are a few

transfer companies in Hutchinson, other than those mentioned, who are doing business, but they are almost outlaws and do only pick-up business. It is noticeable they have no motor trucks.

Therefore, when a transfer company wants to increase its business, decrease its operating expenses and give the public better service, all it need do is motorize its equipment, as did the men in Hutchinson, Kan.

Secretary Houston Sees Biggest Year for Road Building

WASHINGTON, D. C., April 2.—Many important steps have been taken to expedite road construction under the enlarged program recently authorized by Congress, and the indications are that a larger volume of highway construction will be accomplished this season than in any previous year in the history of the Nation, according to a statement issued by David F. Houston, Secretary of Agriculture, today. A conference was held by the Secretary on March 1, with the State Highway Commissioners of the eastern and middle western states, and all phases of the problem, and especially the interpretation of the liberal amendments of the Federal Aid Road Act, were considered. The regulations issued under the act have been carefully revised in the light of past experience, and the suggestions offered by the state highway departments, the standards for plans, specifications and estimates have been modified to meet special conditions existing in some of the states, and other changes in practices and procedure have been and are being made—all with the definite object of speeding up the work. The appointment of Thomas H. MacDonald, chief engineer of the Iowa State Highway Commission, as engineer in immediate charge of the work of the Bureau of Public Roads under the Federal Aid Road Act, has just been announced by the Secretary, and it is planned that, in the near future, Mr. MacDonald will formally assume the position of Director of the Bureau of Public Roads.

Freight Rates an Obstacle

It developed at the conference on March 1 that the present freight rates are one of the principal obstacles to the active resumption and extension of highway activities. The situation was laid before the proper officials of the Railroad Administration on March 1 by representatives of the Department of Agriculture and of the state highway officials. They were given a sympathetic hearing, and the question is now under active consideration by the Railroad Administration. It is hoped that a favorable decision will be made in the near future. Secretary Houston also has taken up with the Secretary of War the question of releasing from the Army highway engineers in this country and abroad, in order that their services may

be utilized during the coming road-construction season.

The Secretary's statement in full is as follows:

"During the war it was necessary to curtail road-construction operations, because of the difficulties of securing transportation, materials and the requisite services. Now that the situation has changed, the work will be actively resumed and vigorously prosecuted, notwithstanding the fact that conditions are still abnormal in some respects, especially with reference to the prices of materials and supplies. It is not believed that the people of the Nation can wait for prices to recede before beginning industrial operations. Such hesitation will add to the difficulties instead of lightening them.

Larger Funds for 1919 Work

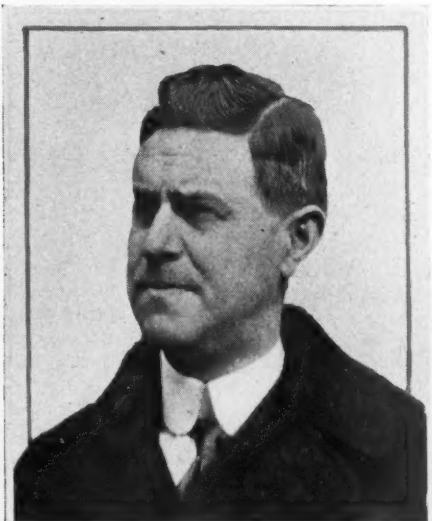
"The Congress, at its last session accepting the recommendations of the Department of Agriculture, not only made available from the Federal Treasury large additional sums for road construction in co-operation with the states, but also made some important amendments to the Federal Aid Road Act. These amendments will have the effect of greatly lessening the difficulties of selecting and constructing needed roads. The amount of Federal funds available for road building on March 1 was over \$72,900,000, which under the law must be matched by at least an equal amount from the states, making a total of \$145,800,000, including approximately \$9,800,000, from Federal and state sources for roads in the National Forests. On July 1, \$95,000,000 more of Federal funds will become available for general road purposes, and \$4,000,000 for National Forest roads, which, with equal contributions from the states, will provide an additional \$198,000,000 for Federal aid road work, making an aggregate sum of \$343,800,000 for the calendar year.

State Road Plans Extensive

The states and their civil subdivisions also will carry on a large amount of road work without Federal aid. The extent of this is uncertain, and will depend upon local labor, industrial and agricultural conditions. The present indications are that approximately \$280,000,000 will be spent in this way.

Fenn Gets Good Publicity for Rural Motor Express

When the National Automobile Chamber of Commerce chose F. W. Fenn as secretary of the Rural Motor Express committee of that body it made a wise choice, for Mr. Fenn has gotten wonderful publicity throughout the country on the subject of the motor truck in rural express service. Any one who has the opportunity of seeing the great news-



F. W. Fenn

papers from all over the United States must have noticed the many articles on the extension of rural motor express in various communities, and practically all of these are from the typewriter manipulated by Mr. Fenn. His work in connection with the various automobile shows throughout the United States has been very valuable to the industry, for he has secured publicity for rural motor express in the newspapers of each city during show time, just when thousands of rural visitors were in the city and would see the articles in the city newspapers.

At the Chicago show Mr. Fenn had a booth at which literature was given out throughout the two weeks' exposition,

and he also addressed the National Automobile Dealers' Association at their annual meeting in Chicago on his pet theme.

Mr. Fenn has the good sense to use material gleaned from the trade journals for much of his publicity work, and many articles from the COMMERCIAL CAR JOURNAL have been sent out from his headquarters to furnish further argument for the adoption of motor express in country districts with good results.

Brick Handling Trucks Spell Profits

A special "two body" detachable truck system has been devised for the handling of brick or any heavy material that is apt to be damaged in transportation. Two or more of these special bodies are an advantage, as they can be loaded and made ready while the truck is out on a trip. When the truck returns it takes only a few minutes to remove the empty body and substitute a loaded one. The empty body is unloaded on to a small truck which runs on rails right into the

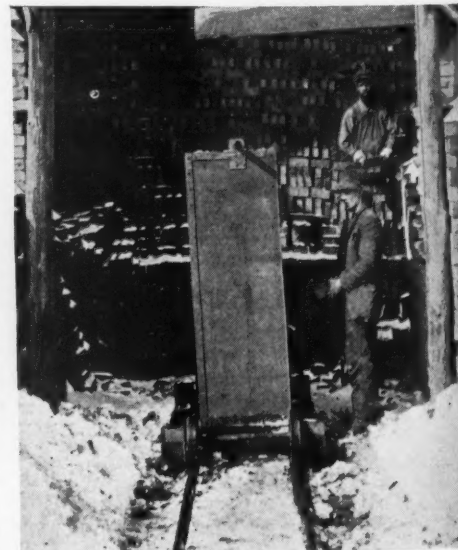
shed or storage room where the brick is piled. The brick is loaded neatly into the body which stands on its side and when it reaches its destination the dump body stands its load of brick on end in a neat pile. Loading time is therefore saved, as one body can be loaded while the truck is delivering and returning the empty body. Another advantage is that the brick is handled without chipping or breakage, and is neatly piled in a smaller space than when dumped. Time and money is also saved by eliminating hand stacking. The loaded body can be taken from the truck by elevator and loaded on a barge or train, without any waste, which has always cut the profits of the brick industry. This outfit has proven a great saver of time, money and labor, as fewer men are employed.

John J. Grothe Co., Inc., recently organized, with Arthur B. McKay, of Medford, Mass., as president, and John J. Grothe, of Woburn, Mass., as treasurer, has purchased the factory at 12-14 Everett St., Woburn, Mass., and will commence the manufacture of motor truck bodies at once.



A Load of Bricks Being Placed on the Truck

The body was built by the American Truck Body Company, Martinsville, Pa.



The Illustration on the Left Shows the Bricks Being Delivered, While the Small Illustration Shows How the Bricks Are Stacked in the Body

Details of the New Revenue Tax Act and What It Means to the Trade

THE new revenue tax ruling looks very much as though it were going to work hardship on the dealer. Talks with the trade indicate but comparatively few of the manufacturers are absorbing the tax and burying it in the wholesale price. The majority are passing it on as a separate item to the jobber. The jobbers again are passing it on to the dealers and the dealer is passing it on to the customer wherever possible, but, unfortunately for the dealer, a large part of his sales, in fact the big sellers, are in nearly every instance widely advertised goods with a more or less standard retail price which is known to the consumer. For this reason, the dealer perhaps, will have to absorb more of this tax than any one along the line.

In some cases the jobbers are adding the tax to each invoice and softening this by means of a stamp or other printed notice on the invoice to the effect that if, during the time of slight uncertainty in regard to the details of the tax, they have charged on any item which does not prove to be taxable, they will be pleased to refund to the dealer. Carrying the tax as a separate item in this way on each invoice makes it comparatively simple to follow up the items which would be a rather difficult matter were the tax swallowed up in the price. Too great care, however, cannot be exercised to see that no tax is added to goods already on hand on which no tax was passed on to the jobber by the manufacturer.

Tax an Indication of Cost of Goods

There seems to be a feeling in the trade, especially among the jobbers, that something should be done so that the tax itself will not be a direct indication of the price paid for the goods. For instance, in the case of small items, such as spark plugs, a tax of 2½ cents passed on to the dealer is, of course, a direct indication that the jobber pays 50 cents for these goods. In the same way, the final consumer is made aware of the price paid for the goods by the dealer, if the tax is not made a part of the retail price. Of course, this trouble is averted wherever the manufacturer himself absorbs the tax.

Points Which Should be Thoroughly Understood

The Government collects the tax from nobody but manufacturers. The tax, if passed on by the manufacturer to the jobber, may again be passed on by the jobber to the dealer and by the dealer to the consumer, but it is a misdemeanor if such tax is included in the price of any article or is added on as a separate item to the price of any article upon which a tax has not been imposed by the Government on the makers.

No jobber or retailer has any right to add the tax either as a part of the price or as a separate item to goods already on hand and paid for before this tax revenue act went into effect.

A Warning

The provisions of the act are very specific in regard to any misrepresentation on the part of those offering goods to the public. For instance, any person who makes a statement, written or oral, in connection with the sale or lease of goods which will lead the buyer to believe that an increased price beyond that actually due to the tax was caused by the tax, is guilty of a misdemeanor punishable by a fine of not more than \$1000 or imprisonment not exceeding one year or both. It behooves the salesman to be very careful how he boosts the price of goods and attributes the increase to the tax. As we read the law, it is perfectly legitimate to add the tax to the price, but no greater price can be charged than the increase due to the tax, and this greater price to be ascribed to the tax.

Brief Summary of Tax Ruling Revenue Act of 1918

(Interpretations of Counsel of N. A. C. C.)

1. All exports of automobiles, and tires, inner tubes, parts and accessories therefor will be exempt from the tax, no matter whether the export is made direct by the factory or through any number of intermediaries. This export exemption is therefore broader than under the old law. All that is necessary is for the manufacturer when he makes the sale, to be able to determine that the sale is for export and that in due course the article is eventually exported.

The Commissioner will shortly issue regulations as to how the intent to export shall be shown. Meanwhile we advise that bills of lading and other papers involved in the transaction clearly show that the shipments are intended for export.

Please note that shipments to the Philippine Islands, the Virgin Islands and Porto Rico are considered export shipments, but the Panama Canal Zone, Alaska and Hawaii are considered part of the United States.

2. Sales of automobiles, tires, inner tubes, parts and accessories to the Federal Government, to a state or political subdivision thereof will continue to be tax free under the new law, and under the new law it will not be necessary to first obtain certain written documents from the buyer. The statement of the manufacturer that the car is sold to the exempt party will be sufficient.

3. Under the new law the taxpayer who sells both at wholesale and retail may estimate the tax on the retail sales

on his customary wholesale price, the customary wholesale price being his highest usual wholesale price, or the wholesale price bearing the least discount.

4. While there is no floor tax under the new law, manufacturers of automobiles, tires, inner tubes, parts and accessories who have on hand such articles made before February 25, 1919, will be subject to the tax when they sell these articles.

5. Under the new law no self-propelled fire extinguishing apparatus will be considered a taxable vehicle. This is a broadening of the old law under which certain particular types of fire extinguishing apparatus were considered taxable automobiles.

6. As the new law contains a penal section (1319) making it a misdemeanor to misrepresent to the purchaser the amount passed on and alleged to be the tax, it is extremely unsafe for taxpayers to use the so-called average tax method.

7. The most troublesome provision of the new law is the tax on tires, inner tubes, parts and accessories. The Revenue Bureau is having considerable difficulty in getting an exact and workable definition of parts and accessories. It will probably rule that substantially complete manufactured articles of commerce which form parts or components of a complete automobile or which are attached to or used with an automobile are taxable parts and accessories, provided they are primarily intended for such use. This would mean that sheet metal, lumber, leather, wire and the like would be considered "mate al" and not taxable. Also that incompletely manufactured articles such as forgings for crankshafts, blanks for gears, and the like would not be taxable. Likewise completely manufactured articles such as ordinary bolts, rivets, screw drivers, wrenches and the like would not be taxable because they are not primarily intended for the automobile but have many other uses.

8. Spark plugs would probably be considered as primarily intended for automobiles and therefore taxable. The ruling on ball bearings is debatable.

9. Whatever may be the proper definition of parts and accessories another troublesome point is that sales of such parts and accessories as well as tires and inner tubes to automobile manufacturers are exempt from tax. The Revenue Bureau will probably rule that the sale of such articles by their makers to automobile manufacturers who intend to embody them in their product will be tax exempt, but that any excess purchased for the purpose of replacing defective parts or of selling to car users to replace articles worn out in use would be subject to the tax, with the right of the taxpayer to obtain a refund or credit of

taxes if it can be demonstrated that the articles were either given in replacement or were embodied in the complete automobiles by the factory. Parts or accessories which are usually charged for, pending settlement of the question, as to whether they should be free replacement parts are tax free, but of course are treated as a taxable sale if it is found that the returned part is not defective. It is advisable to make shipment of such replacement parts on memorandum.

10. In other words, the Bureau is inclined to consider that the factory, when it makes the cars, is operating as an automobile manufacturer, but when it sells repair parts it is not, therefore the sale for this latter purpose is not exempt from the tax. This is considered highly unsatisfactory and steps are being taken to obtain a more practicable ruling.

To aid in interpreting the law, two pertinent sections of the Act are given verbatim below.

If any manufacturer, producer, or importer of any of the articles enumerated in this section, customarily sells such articles both at wholesale and at retail, the tax in the case of any article sold by him at retail shall be computed on the price for which like articles are sold by him at wholesale.

The taxes imposed by this section shall, in the case of any article in respect to which a corresponding tax is imposed by section 600 of the Revenue Act of 1917, be in lieu of such tax.

Sec. 1319. That whoever in connection with the sale or lease, or offer for sale or lease, of any article, or for the purpose of making such sale or lease, makes any statement, written or oral, (1) intended or calculated to lead any person to believe that any part of the price at which such article is sold or leased, or offered for sale or lease, consists of a tax imposed under the authority of the United States, or (2) ascribing a particular part of such price to a tax imposed under the authority of the United States, knowing that such statement is false or that the tax is not so great as the portion of such price ascribed to such tax, shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not more than \$1,000 or by imprisonment not exceeding one year, or both.

Sec. 1405. That this Act may be cited as the "Revenue Act of 1918."

New York State Has 75,309 Trucks

NEW YORK CITY, March 31.—The annual report of Secretary of State Francis M. Hugo, shows that of New York's total of 463,758 motor vehicles licensed during the past year, 75,309 were commercial motor vehicles. There were 18,105 omnibuses and 2218 trailers licensed. In Greater New York there were 31,561 trucks, 6408 omnibuses and 624 trailers.

The state collected in fees the total of \$4,872,562.25 from automobile owners, of which Greater New York contributed \$1,942,845.50.

Specific Information Wanted Regarding the War Tax

To the Editor:

When does the war tax become payable, weekly, monthly, or yearly?

Is the tax levied on the gross selling price?

Where parts are furnished for repairs like we do, how is it possible for us to know what portion goes into commercial or tractor cars on the 3 per cent. tax, and what part goes into the passenger cars at 5 per cent.?—Grossman Auto Parts Co.

The law states that every person liable for tax imposed on automobiles, motor trucks, parts and accessories shall make monthly returns under oath in duplicate and pay the taxes imposed to the collector for the district in which is located the principal place of business. Such returns shall contain such information and be made at such times, and in such manner as the Commissioner, with the approval of the Secretary, may by regulations prescribe.

The tax shall, without assessment by the Commissioner or notice from the collector, be due and payable to the collector at the time so fixed for filing the return. If the tax is not paid when due there shall be added as part of the tax a penalty of five per cent., together with interest at the rate of one per cent. for each full month, from the time when the tax became due.

We are advised that up to date no regulations for the filing of the returns have been promulgated by the Commissioner. They expect, however, that some action will be taken on or about April 20th, at which time you should get in touch with your local collector, asking whether or not any such regulations have been issued. The tax for the last four days of February and the entire month of March must be paid on or before April 30th, the tax for the month of April on or before May 31; in other words, the tax for each month must be paid prior to the last day of the ensuing month.

The tax is levied on the gross selling price; so far as you are concerned you pay no tax whatsoever on any parts furnished to the manufacturer of passenger cars or motor trucks, whether these are used in production of finished cars or whether they are merely used for repair purposes; the manufacturer of the completed car must pay the tax. On the other hand when you sell parts to any other manufacturer, that is to say a jobber, dealer or consumer, the tax is five per cent., regardless of whether they are used on a passenger car or on a motor truck.

As regards tractors, there is no tax whatsoever either for the complete machine or any parts furnished therefor.

N. A. C. C. Compiling a Tax Primer

The National Automobile Chamber of Commerce is assisting the industry in an understanding of the new taxes by the preparation of a tax primer. The Revenue Bureau has promised its assistance in connection with this and will supply written rulings on all doubtful points.

The Townsend Bill Provides for National Highway System

A network of durable roads will be constructed and forever maintained by the United States Government, if a bill recently introduced before Congress by Senator Charles E. Townsend, of Michigan, meets with favorable consideration from the members of the next Congress.

In the opinion of Roy D. Chapin, chairman of the Highways Committee of the National Automobile Chamber of Commerce, the measure provides for a radical revision in the highway policy pursued by the Government in the past, and lays the foundation upon which economic expenditure of hundreds of millions of dollars will be secured.

Briefly analyzed, the measure provides for two main trunk line highways in each state, constructed to link up with corresponding state roads at boundaries, thus providing a complete national system of lines. These roads would be constructed under the supervision of a Federal highway commission of five men after a thorough investigation into traffic requirements of each state, with due consideration for the needs of interstate highway commerce, which has shown remarkable gains in the past few years.

"The measure does not stop there," said Mr. Chapin, "it recognizes the fact that we must always be at the task of improving and constructing our state highways and accordingly, provision is made for a continuance of Federal aid to the states in order that the state highway commissioners may have at their disposal sufficient funds to enable them to construct their lateral highways to the main trunk lines.

"The road problem is too big a one to be handled by a bureau of a department. Few domestic activities of the national government will be of more importance in the next few years, and the work should be in the hands of a body of men who have the authority to make all decisions without referring to another official already burdened by numerous and diverse problems of considerable magnitude in themselves.

"Senator Townsend's bill seems to take all of these factors into consideration and I am hopeful that his introduction of it will result in a national discussion of this problem, since the subject is one which should attract the best thought of the nation."

French Government to Allow Importation of Tractors

WASHINGTON, March 18.—A cablegram received from Bernard M. Baruch, states that "The French Government is willing to allow sales to French merchants of \$40,000,000 worth of machine tools and all agricultural implements if commercial credits for one year can be arranged." Details of the plan are not yet known, but farm tractors will be included under this ruling.

Philadelphia Post Office Starts Rural Motor Truck Route

PHILADELPHIA, April 1.—Philadelphians will now be able to get butter, eggs, and other farm products at prices somewhat lower than the regular market prices, and probably in better condition. The post office has sent out a list of producers and dealers in food stuffs, garden truck or similar commodities, who live on or adjacent to the Rural Motor Truck Parcel Post routes operating in the vicinity of Philadelphia.

This service endeavors to deliver to addresses, or consumers, food stuffs shipped thereon on the same day of shipment or on the first parcel post delivery of the next succeeding day. Consumers are urged to make such business arrangements with producers as will render it unnecessary to continually communicate with one another. Metal, paper or wooden containers that may be reused frequently, can usually be obtained at dairymen's supply houses or hard-

ware stores. The post office states that it may be found advantageous for several persons in the same neighborhood to group together and order eggs by the crate, and butter by the several pounds and other commodities in quantity, and have them sent to the one address.

Two parcel post trucks leave Lancaster for Philadelphia daily. The Lancaster-Gettysburg truck brings from McConnellsville, Fulton County, daily to Lancaster great quantities of eggs destined for Philadelphia. The eggs, shipped at 6 A. M., reach Philadelphia the same evening. That same truck brings from Abbotstown, Adams County, eggs that can now be obtained in any quantity at thirty cents per dozen. Large shipments are being made daily to Philadelphia and Baltimore from southern Lancaster County by commission men of those cities, who sell at very profitable figures over the purchase price. During the week of the Philadelphia Motor Truck Show a truck load of eggs was delivered by the Lancaster-Philadel-

phia parcel post truck to the Commercial Museum building. The load was comprised of seventy crates, containing 2100 dozens, and was intended to demonstrate the value of truck service.

Cleveland Truck Dealers Meet

CLEVELAND, OHIO, March 21.—Fifty motor truck dealers attended the regular monthly meeting and dinner of the Motor Truck Dealers' Association, held last night at the Hotel Winton.

A report of the work of a committee of the association, which recently appeared before the State Legislature to protest a bill pending, designed to restrict the weight of vehicles and loads using the highways, was given during the meeting.

The B. F. Goodrich Rubber Co. presented a moving picture, showing the manufacture of various products, many of which were manufactured for Government use during the war.



Philadelphia's Truck Show Proved a Surprise to Business Men

That the motor truck dealers of Philadelphia can put over a truck show of some magnitude was evidenced by the showing made during the week of March 17th in the Commercial Museum Building. Nearly 200 chassis were exhibited, while a few tractors, truck attachments and trailers lent variety to the exhibits. Quite a number of standard types of bodies were shown. The influence of the large pneumatic tire was also noticeable. One new truck was displayed, the Keystone, made by the Keystone Motor Truck Corporation, Incorporated, 1714 N. Broad Street, Philadelphia. This is a two-ton assembled job listing at \$1795, and which will be in production shortly. The larger sized Vim models also made their debut at this show, although they have been on the market for some time.

Boston Truck Dealers Hold Sales-room and Street Exhibits

BOSTON, March 21.—For the first time since 1913, the Boston Automobile show did not include commercial cars, due to the fact that the Government did not vacate the Mechanics' Hall basement. The Boston Automobile Dealers' Association and the Boston Commercial Motor Vehicle Association, which have for several years past, jointly held the above shows, arranged the 1919 dates as late as was practical, in the hope the basement would be vacated, but the delay did not produce the desired result.

Despite announcements made that no trucks would be exhibited, many of those who attended, particularly from out of town, were heard to inquire where the trucks were, and practically every one expressed keen regret that no space was given over to commercial cars. This brings up the suggestion made by a Boston dealer of the practicability of conducting in the future a separate truck show. Previous to 1914 there were three separate shows held, and while conditions in Boston may differ from those in New York, there is every reason to believe that, with the increasing interest in motor highway transportation Boston could successfully and profitably swing a commercial car show in 1920.

Failing to participate in the show resulted in the dealers conducting shows in their salesrooms, and this was not alone

confined to Boston proper, but the dealers in the suburbs took advantage of the opportunity to attract attention to their lines. Some of these provided motor conveyance from Mechanics' Hall, and in some instances the trucks bore signs announcing this fact.

Those interested in commercial cars were afforded an opportunity to note the location of any particular make in which they were interested by the large sign-board in the lobby of Mechanics' Hall, which gave the names and addresses of the various dealers. Many of the visitors took advantage of this service.

Street Display Comprehensive

In addition to the displays in the salesrooms, there was the street display, in which the greater number of dealers participated. The machines lined the curb on Huntington Ave., and in the parking space adjacent to the entrance to Mechanics' Hall, and many and varied methods were utilized to attract attention.

One dealer, handling a well known make, demonstrated the pulling abilities, as well as the efficiency of the clutch, by mounting a cement block, of weight equalling the carrying capacity of the chassis, and backing the truck over the curb. This demonstration attracted a great deal of attention. Another dealer

mounted a special type of van body designed for transporting live stock. A runway led to the body, and standing in a stall, specially constructed for transporting animals, was a horse. He seemed to enjoy the attention he attracted, and was in no way downcast by being associated with his successor.

Demonstrates Tractor

The street display included two tractors. One was a converted unit, and it was shown with a two-gang plow. The other, a Cleveland tractor, was demonstrated in the parking space, the operator putting the machine through its paces, showing particularly its short turning radius.

The big pneumatics, 40 x 8, on one well known make of truck, proved a big drawing card, particularly to the out-of-town dealers and visitors, to whom the big tire was a novelty. Truck pneumatics were shown at several salesrooms.

Special Bodies Displayed

While the majority of the trucks shown in the street were chassis only, a number were noted with special bodies, with the dump and hoist types predominating. These were not confined to the standard makes, but one or two were seen on converted units. Although trucks were not displayed in Mechanics' Hall, there were three types of converters or adapters in the basement, a section of which was given over to the display of accessories, and these included a few standard makes for commercial cars.



A Fulton Chassis With Cement Block Drew Large Crowds, and It Was Backed Over the Curb to Demonstrate Its Power



Dump and Hoist Bodies Were Included in the Street Show at Boston



A Line of the Trucks on Huntington Avenue. Big Sign-Boards and Placards Were Much in Evidence



The International Was Shown With 40x8 Tires, and the Big Pneumatics Proved a Magnet to the Out of Town Dealers

Big Men of the Motor Truck Industry Gather in Philadelphia to Attend Sales Managers' Convention

To Discuss Vital Problems Now Confronting the Industry. To Create National Association of Motor Truck Dealers

THE National Association of Motor Truck Sales Managers, whose quarterly convention is being held in Philadelphia at the Bellevue-Stratford, on April 11th and 12th, has steadily grown, until now over fifty of the largest manufacturers of motor trucks in the United States are members.

It originally started as an Association of Sales Managers only, but at the Philadelphia Convention there will be represented, in addition to sales managers—officers, executives and directors of the various companies, so that the Association becomes one of the most representative and influential in the great motor truck industry.

The aim and object of the National Association of Motor Truck Sales Managers is the advancement of the industry, the correction of trade evils, and the promotion of the interests of the motor

truck dealers. In fact, the Sales Managers are at present considering a plan of organizing the dealers throughout the country, so as to make it possible for their agents to be eminently successful. When these plans are put into force this Association will nationally embrace, in a movement of importance to the trade, all the dealers who handle their products in the United States and will join and co-operate with the men who buy and sell their products.

The National Association of Motor Truck Sales Managers was organized a

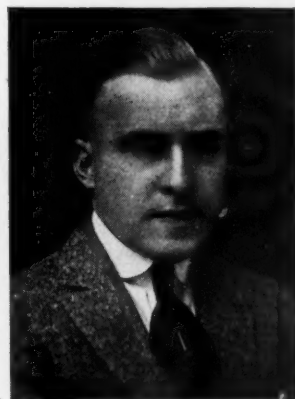
short time ago by the sales managers of the leading truck companies because they saw the necessity for co-operative work in solving the problems which confront the manufacturer, the dealer and the user.

The sales managers, being the men on the firing line, are better able to appreciate the troubles of the dealer and consumer than were the executives, and therefore their Association is the first in the automobile trade to fully realize the necessity for co-ordination of effort of the maker, the seller and the buyer.

After the Association had been in existence for several months, the sales managers realized that it was growing so rapidly and becoming of so much importance that it would be necessary for them to make it an organization which would include other executives of the companies, and hence a change was de-



J. M. Carney
Executive Secretary



E. T. Herbig
Secretary



J. E. Tracy
President



H. T. Boulden
First Vice President



A. R. Fernald
Treasurer



W. D. Rightmire
Second Vice President

Officers of the National
Association of Motor Truck
Sales Managers

cided upon, and the membership of the organization now consists of the sales managers and officers.

This plan is preliminary to the creation of a National Association of the Motor Truck Dealers throughout the United States, to be divided into state committees and sub-committees, according to Congressional districts, cities and towns. This is the first effort on the part of any association in the automobile industry to tie together all the interests in a national organization for the benefit of those interested in the motor truck business.

With the completed national organization it will be possible to eliminate many of the evils which exist today.

The automobile interests of Philadelphia desiring to extend a substantial welcome to the delegates attending the convention have organized what is known as the Convention and Reception Committee, composed of the following:

Convention and Reception Committee

C. A. Musselman, Chilton Co., chairman.

Philadelphia Auto Trade Association:

Chairman, E. H. Fitch, 519 N. Broad St.

W. B. McCullough, 219 N. Broad St.

W. G. Herbert, N. E. Cor. Broad and Race Sts.

Motor Truck Association of Philadelphia:

Chairman, Lee J. Eastman, Packard Motor Car Co., 319 N. Broad St.

J. C. Schwartz, Gomery-Schwartz Motor Car Co., 128 N. Broad St.

W. H. Metcalf, Wire Wheel Corp. of America, 328 N. Broad St.

Automobile Accessories Business Association:

Chairman, W. Ross Walton, Firestone Tire & Rubber Co., 312 N. Broad St.

G. B. Shearer, Gaul, Derr & Shearer Co., 217 N. Broad St.

N. A. Petry, N. A. Petry Co., Inc., 1307 Race St.

The Philadelphia Automobile Trade Association and the Motor Truck Association

of Philadelphia have joined hands in extending an invitation to the delegates to attend a luncheon to be held at the headquarters of the Philadelphia Automobile Trade Association, Broad and Callowhill Sts., at Friday noon. Delegates will be guests of the associations at this luncheon.

Automobiles will be provided to take the delegates from the Bellevue to the headquarters of the Philadelphia Automobile Trade Association and back again for the afternoon session.

The officers of the Sales Managers' Association for this year are:

J. E. Tracy, president; Sterling Motor Truck Co., West Allis, Wis.

H. T. Boulden, first vice-president; Selden Truck Sales Co., Rochester, N. Y.

W. D. Rightmire, second vice-president; Winther Motor Truck Co., Winthrop Harbor, Ill.

E. T. Herbig, secretary; Service Motor Truck Co., Wabash, Ind.

A. R. Fernald, treasurer; Willys-Overland Co., Toledo, Ohio.

J. M. Carney, executive secretary; 1344 Wells Bldg., Milwaukee, Wis.

The directors are:

H. T. Boulden E. T. Herbig

A. C. Burch F. J. Pardee

A. R. Fernald F. L. Pierce

J. E. Tracy



C. A. Musselman, Chairman



E. H. Fitch



W. B. McCullough

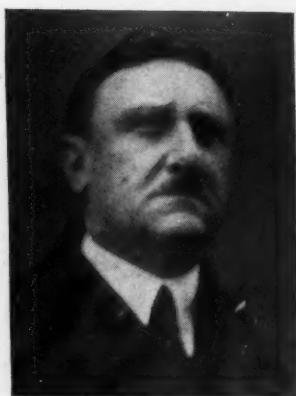


W. G. Herbert



Lee J. Eastman

Members of the Convention and Reception Committee



J. C. Schwartz



W. H. Metcalf



W. Ross Walton



G. B. Shearer



George C. Gordon
President, Selden Truck Sales
Company

Delegates and Members Attending the Conven- tion in Philadelphia



C. H. Woodruff
Sales manager, O. Armleder
Company



Milo D. Herron
Sales director, Dart Truck and
Tractor Corporation



E. A. Kingsbury
Secretary and general manager,
Sanford Motor Truck Company



H. A. Conlon
Sales manager, Acason Motor
Truck Company



F. G. Elder
Treasurer and acting sales man-
ager, Day-Elder Motors Corp.



S. Deutsch
Vice president and sales manager,
Signal Motor Truck Company



A. J. Sanderson
General sales manager, Maccar
Truck Company



H. F. Harris
General sales manager, Republic
Motor Truck Company, Inc.



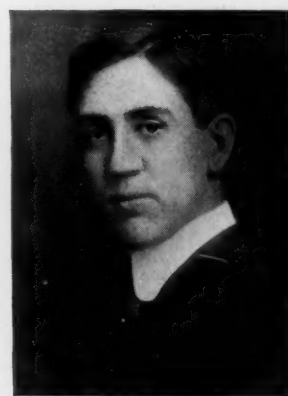
Wilbur F. Reynolds
Export manager, Selden Truck
Sales Company



J. F. Bowman
Sales manager, Garford Motor
Truck Company



R. E. Chamberlain
Truck sales manager, Packard
Motor Car Company



I. M. Lewis
Treasurer and sales manager,
Bessemer Motor Truck Co.



A. R. Cosgrove
Sales manager, Atlas Truck Dept.,
Martin Truck and Body Corp.



C. J. Helm
Sales manager, Acme Motor
Truck Company



A. F. Dutton
Sales manager, Master Trucks,
Incorporated



Homer Hilton
Sales manager, Oshkosh Motor
Truck Mfg. Company



Wayne W. Light
Sales manager, Vim Motor
Truck Company



C. A. Wales
Truck sales manager, Loco-
mobile Company of America



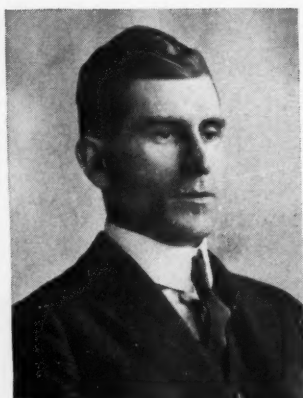
A. E. Schafer
Sales manager, Gramm-Bern-
stein Motor Truck Company



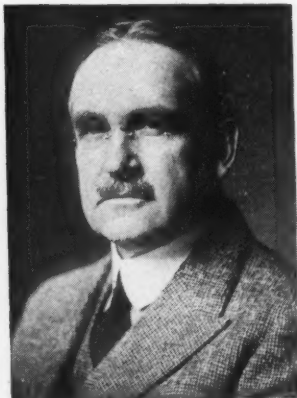
W. S. Stevenson
General sales manager, Beth-
lehem Motors Corporation



A. C. Burch
Vice president and sales mana-
ger, Clyde Cars Company



W. J. Male
Sales manager, Stewart Motor
Corporation



Homer A. Jones
Sales manager, Ward LaFrance
Truck Company, Inc.



A. J. Whipple
General sales manager, Diamond
T Motor Car Company



F. J. Alvin
General manager, United States
Motor Truck Company



W. A. Elliot
Sales manager, Superior Motor
Truck Company



J. C. Ayers
Vice president, Denby Motor
Truck Company



Albert Staab
Sales manager, G. A. Schacht
Motor Truck Company



W. A. Clare
General sales manager, Atter-
bury Motor Car Company



Leigh Lynch
Secretary and sales manager,
Columbia Motor Truck &
Trailer Company



A. Langenbacher
Sales manager, Duplex Truck
Company



F. L. Pierce
Sales manager, Federal Motor
Truck Company



R. W. Walker
Assistant general manager,
Hurlburt Motor Truck
Company



J. D. Potter
President and sales manager,
American Motor Truck
Company



C. G. Barley
President and sales manager,
Indiana Truck Corporation



R. S. Stewart
Vice president United States
Motor Truck Company



Donald F. Whittaker
Advertising and assistant sales
manager, Acason Motor
Truck Company

Friday Morning, April 11.

- 1—Meeting called to order.
Roll call of members.
- 2—Address of Welcome by Lee J. Eastman, President Packard Motor Car Co. of Philadelphia, who speaks in behalf of the Philadelphia Motor Truck Dealers' Association and the Philadelphia Chamber of Commerce.
- 3—Response and Introductory Address. "The National Association—Its Aims and Objects." Mr. John E. Tracy, President National Association Motor Truck Sales Managers.
- 4—Enrollment of New Members. Report of Membership Committee.
- 5—Report of Standing Committees. New Business.
- 6—"What Are the Truck Manufacturers Doing in Their Sales Departments to Justify the Contemplated Increased Production?" E. S. Foljambe, Directing Editor, Chilton Publications. Open discussion—Answering of questions.
- 7—"Can We Improve the Present Standard of Service and Parts Policies and Standard Warranty?" E. T. Herbig, Sales Manager Service Motor Truck Co., Wabash, Ind. Open discussion—Answering of questions.
- 8—"The Dealer and Truck Advertising." Sidney J. Stern, Advertising Manager *The Automobile Trade Directory*, New York.

Program of the Two Days' Session

Open discussion—Answering of questions.

Friday Afternoon, April 11.

- 1—Meeting called to order.
Roll call.
- 2—"For the Good of the Industry." C. G. Barley, President Indiana Truck Corporation, Marion, Ind. Open discussion—After Mr. Barley's paper we strongly urge a frank and open discussion on trade abuses.
- 3—"New Slants in Advertising as Applied to Motor Truck Selling." Henry M. Hobart, General Sales Manager International Magazine Co. Open discussion.
- 4—"What Can the Factory Do to Make the Local Truck Dealer a Success?" W. H. Baker, General Manager Baker Motor Sales Co., Inc., Boston, Mass. Open discussion.
- 5—"What Is the Dealer's Attitude Towards the District Manager, and Does Supervision of the Dealer Through That Source Answer the Purpose for Which it is Intended?" J. C. Ayers, Vice-President Denby Motor Truck Co., Detroit, Mich. Open discussion.

- 6—"Is the Passenger Car Distributor of Today the Ultimate Truck Dealer of the Future?"

A—"An Exclusive Motor Truck Dealer." Represented by Mr. Gale Smith.

B—"A Dealer Who Handles Both Passenger Cars and Motor Trucks." Represented by Mr. L. S. Bowers.

C—"A Dealer Who Handles Only Passenger Cars and Who Has Not Been 'Sold' on the Truck." Represented by Mr. W. H. Metcalf.

Friday Evening, April 11.

Banquet Speakers.

- J. E. Tracy, President National Association of Motor Truck Sales Managers, Milwaukee, Wis.
- Hon. R. O. Moon, Toastmaster, Ex-Congressman, Philadelphia, Pa.
- Col. Fred Glover, Chief, Motors Division Quartermaster's Corps, will talk on the subject of the disposal of the Government's trucks and other information of vital interest to the truck industry.
- John Barrett, Director-General of the Pan American Union and Foreign Minister to Argentina, Colombia and Panama, will talk on "Central and South America—the Great Opportunity."
- Edw. James Cattell, City Statistician, Philadelphia.

John S. Cravens, Chairman Highways Transport Committee of the Council of National Defense, Washington, D. C.

H. Walton Heegstra, Chicago, Ill.—with a few remarks—"If I Sold Things."

C. A. Musselman, Regional Chairman Highways Transport Committee, Philadelphia.

Saturday Morning, April 12.

1—Meeting called to order by President J. E. Tracy.

2—"What Is the Future of the Farm Tractor in the Motor Truck Industry." F. A. Seiberling, of the Good-

year Tire & Rubber Co., and H. E. Everett, Managing Editor of CHILTON TRACTOR JOURNAL.

Open discussion.

3—"Territory Research and Truck Distribution." Harry Tipper, Class Journal Co., New York.

Open discussion.

4—"Sales as Affected by Extended Use of Trucks in Post Office Work." C. A. Wales, Locomobile Co. of America, Bridgeport, Conn.

Open discussion.

5—"Hiring and Training Salesmen." H. Walton Heegstra, Chicago.

6—"The Influence of Sales Organizations on Highway Development." E. J. Mehrns, Editor *Engineering-News Record*, New York City.

7—"Simplicity and Advantages of Keeping Truck Costs—Knowledge of Cost to Operate Means Satisfied Owners and Increased Sales." A. S. Duckworth, David Lupton Sons Co., Philadelphia.

8—"The Economic and Financial Phases of Highway Transport." Charles W. Reid, Committee of National Defense, Washington, D. C.

Members of National Association of Motor Truck Sales Managers and Delegates



Acason Motor Truck Company, Detroit, Mich. H. A. Conlon, vice-president; Donald F. Whittaker, assistant sales manager.

Acme Motor Truck Co., Cadillac, Mich. W. A. Kysor, president and general manager; C. J. Helm, sales manager.

American Motor Truck Co., Newark, Ohio. J. D. Potter, president; E. B. Phillips, vice-president.

Armleder Co., The O., Cincinnati, Ohio. C. H. Woodruff, sales manager.

Atterbury Motor Car Co., Buffalo, N. Y. E. J. Berlet, president Stability Motors Co., Phila.; J. R. Spraker, vice-president; W. A. Clare, sales manager.

Available Truck Co., Chicago. Edw. F. King, secretary.

Bessemer Motor Truck Co., Grove City, Pennsylvania. I. M. Lewis, treasurer; W. F. Townsend.

Bethlehem Motors Corp., Allentown, Pa. A. T. Murray, president; Martin E. Kern, vice-president; M. H. Beary, secretary; W. S. Stevenson, sales manager; R. S. Davey.

Brookway Motor Truck Co., Cortland, N. Y. F. R. Thompson, secretary; W. D. Morse, sales manager; S. E. Marley, branch manager.

Clyde Cars Company, The, Clyde, Ohio. A. C. Burch, vice-president.

Columbia Motor Truck & Trailer Co., Pontiac, Mich. F. G. Clark, president; Leigh Lynch, secretary.

Commerce Motor Car Co., Detroit, Mich. W. E. Parker, president.

Dart Motor Truck Co., Waterloo, Iowa. M. D. Herron, sales director.

Day-Elder Motors Corp., Newark, N. J. Chas. P. Day, president; F. G. Elder, treasurer and sales manager; H. G. Reid, East Dist. sales manager.

Denby Motor Truck Company, Detroit, Mich. Garvin Denby, president; J. C. Ayers, vice-president.

Diamond T Motor Truck Co., Chicago, Ill. Sidney A. Cook, secretary; A. J. Whipple, sales manager.

Duplex Truck Company, Lansing, Mich. A. Langenbacher, sales manager.

Federal Motor Truck Co., Detroit, Mich. F. L. Pierce, sales manager.

Garford Motor Truck Co., Lima, Ohio. J. F. Bowman, sales manager.

Gramm-Bernstein Motor Truck Co., Lima, Ohio. B. A. Gramm, president; R. W. Austin, 2nd vice-president; A. E. Schaefer, sales manager.

Harvey Motor Truck Company, Harvey, Ill. W. J. Dietrich, general sales manager.

Huriburt Motor Truck Co., New York, N. Y. R. W. Walker, assistant general manager.

Indiana Motor Corporation, Marion, Ind. C. G. Barley, president.

Kissel Kar Co., Hartford, Wis. C. A. Williams, sales manager.

Lane Motor Truck Co., Kalamazoo, Mich. L. W. Hamilton, president and general manager.

Little Giant, Chicago Pneumatic Tool Co., Chicago. T. J. Hudson, manager Motor Truck Sales Division.

Locomobile Company of America, Bridgeport, Conn. Claude Almyr Wales, truck sales manager.

Maccar Truck Co., Scranton, Pa. A. J. Sanderson, sales manager.

Martin Truck & Body Corporation, York, Pa. F. M. Small, president; A. R. Cosgrove, sales manager; E. B. Van Hook, advertising manager.

Master Trucks, Inc., Chicago. A. F. Dutton, sales manager.

Menominee Motor Truck Co., Menominee, Mich. William A. Frise, sales manager.

Nelson Motor Truck Co., Saginaw, Mich. Glenn P. Hiller, sales manager.

Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis. Homer Hilton, sales manager.

Packard Motor Car Company, Detroit, Mich. R. E. Chamberlain.

Parker Motor Truck Co. L. L. Newton, general manager.

Republic Motor Truck Co., Alma, Mich. R. W. Ruggles, president; H. F. Harris, sales manager.

Rowe Motor Manufacturing Company, Lancaster, Pa. Samuel J. Rowe, president; L. S. Allen, vice-president.

Sanford Motor Truck Co., Syracuse, N. Y. E. A. Kingsbury, general manager.

Schacht Motor Car Co., Cincinnati, Ohio. Albert Staab, sales manager.

Seiden Truck Sales Company, Rochester, N. Y. Geo. C. Gordon, president; H. T. Boulden, vice-president-sales director; C. Henry Mason, advertising manager.

Service Motor Truck Co., Wabash, Ind. M. Cook, secretary; E. T. Herbig, sales manager.

Signal Motor Truck Co., Detroit, Mich. S. Deutsch, sales manager.

Sterling Motor Truck Co., Milwaukee, Wis. R. G. Hayssen, president; Frank Luick, secretary-treasurer; J. E. Tracy, general sales manager.

Stewart Motor Corporation, Buffalo, N. Y. W. J. Male, sales manager.

Superior Motor Truck Co., Atlanta, Ga. W. A. Elliot, sales manager.

U. S. Motor Truck Co., Cincinnati, Ohio. Robt. S. Stewart, vice-president; Forrest J. Alvin, general manager.

Velle Motors Corporation, E. R. Gardner, sales manager.

Willys-Overland, Inc., Toledo, Ohio. A. R. Fernald, manager commercial car division.

Wilson, J. C. Co., Detroit, Mich. E. D. Hand, vice-president and sales manager; S. C. Wilson, secretary-treasurer.

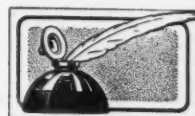
Winther Motor Truck Co., Winthrop Harbor, Ill. M. P. Winther, president; Wm. Martinson, vice-president; W. D. Rightmire, secretary; Wm. Hinrichs, treasurer.

WELCOME





EDITORIALS



One Reason Why Railroads Want Short Haul Business

A RECENT report shows that there are now in use in the United States two and one-half million freight cars, of which number 370,000 were standing idle on sidings on February 1st. This is said to be the largest number of cars standing idle at any one time since 1908.

Of course there is a very good reason why freight has dropped off suddenly. The manufacture of munitions and other war material being cut off at a stroke, the manufacturers must adjust themselves to existing conditions, and during this period of adjustment the factories of course are not producing in large quantities.

The present number of cars standing idle, however, is good and sufficient reason why the railroads have recently been looking for any and all kinds of merchandise, including short haul shipments.

If this state of affairs continues, the truck will be in direct competition with steam transportation. The advantage of time is on the side of the motor transport, but, to retain the business permanently, trucks must reduce the cost to the minimum. Efficient operation and the establishment of return load bureaus should be given earnest consideration by the truck dealers.

Proposed Legislation Detrimental to Trailers and Highways Transportation

NOWHERE is the need for organization in the truck industry, particularly among the retail trade, more clearly shown than in the difficulty the truck interests are having to successfully combat adverse legislation such as that recently proposed and now pending in the Michigan and Illinois Legislatures.

Bills now pending in both of these states would prohibit the use of more than one trailer with a truck, supposedly on account of damage to the road. These bills also limit the speed to 12 miles an hour.

A trailing vehicle does less damage to the road than a vehicle that is operating under power. The load is uniformly distributed over the four wheels and on account of the lack of driving effort the trailer wheels damage the road less than those of a power driven vehicle. That the roads would be damaged more by two trailers carrying an equivalent load to that of trucks with individual trailers, is of course a fallacy.

Wide rubber tires which do not damage the roads are used. Trailers also cut down the speed, which is again favorable to the road surface. There is no need for legislation against the speed of trucks with trailers, particularly if more than one trailer is used.

Modern highways transportation demands the use of trailers. Not one trailer, but several trailers, will be common in the near future. If motor trucks compete with the railroads on long distance hauls they must operate efficiently. Trailers are one of the methods of carrying loads efficiently.

There should be organized effort on the part of the truck industry to assist the Trailer Association in its fight. The interests of the truck maker and the trailer maker are one and the same, namely, economical highways transportation by power. Any legislation detrimental to one, harms the other.

Pneumatics for Trucks, or Trucks for Pneumatics

THAT the use of pneumatic tires on commercial cars is growing very rapidly cannot be denied. Recent highway transportation development has brought about a gradual increase in speed and long distance hauling. Pneumatic tires in ever increasing quantities are being made and used for this purpose, but the question that arises from the engineering and designers' standpoint is: are trucks being built for use with pneumatic tires?

Trucks are built along heavy lines for the express purpose of withstanding vibration due to the use of solid tires. The factor of safety is always higher than it is in a passenger car that is built to run on pneumatics. More metal is employed all through the construction than is really necessary if the truck is to use pneumatic tires. In other words, a truck designed for use with solid tires is not properly designed for use with pneumatic tires. It is too strong. This may sound peculiar, but nevertheless from the designers' standpoint a thing can be made too strong. In other words, an excessive amount of weight is being carried. This reduces by just that amount the pay load which may be carried, necessitates the use of larger and heavier tires and makes the entire job more costly both to manufacture and to operate.

The use of pneumatic tires on commercial cars is an established fact. It is high time that the designers recognize this as a fact and design trucks accordingly. Far lighter construction throughout can be used successfully. Even truck accessories will be modified by the use of pneumatic tires on trucks. And last but not least is the driver who is certainly also affected by this change.

News of the Trade in Brief

Vehicular Tunnel Bill Passed

NEW YORK, March 28.—The Senate passed the Adler bill providing for the construction of the vehicular tunnel from New York to New Jersey, yesterday, there being few negative votes. The bill appropriates \$1,000,000, and the Assembly will concur, with slight amendments, it is said.

A large number of organizations and business men have been active in support of the bill, and among the automobile associations that helped put through the legislation are the Motor Truck Association of America, the Automobile Club of America, the Automobile Dealers' Association, National Automobile Chamber of Commerce, Truck Owners' Association and others.

One of the interesting features was the large number of letters that were written by business men representing all industries, all of whom advocated the building of the tunnel as an economic necessity. Food and produce dealers stated that the tunnel would eliminate the waste resulting from extra trucking charges and unreasonable delays at the ferries, etc. It is believed that the tunnel will greatly stimulate the use of motor trucks for hauling food products into New York and enable trucks to successfully and profitably compete with the common carriers.

Government Not Going to Sell Trucks

WASHINGTON, April 8.—According to a statement given out today to the daily press by acting Secretary Crowell, the requirements of the various government departments will consume virtually the entire War Department surplus in motor trucks and motor cars.

The Department of Agriculture alone, in connection with the road building activities of the Government, in co-operation with the states, he added, will take over a vast quantity of motor equipment.

Delivery of war contracts for trucks and all other equipment has reached its peak, Mr. Crowell said. These deliveries represent the completion of the portion of the orders which could not be suspended when hostilities ceased, fabrication having advanced too far or the plants not being prepared to shift easily to peacetime production.

Much of the material cannot be left to stand in the weather without serious damage, the secretary pointed out. At the proving grounds, storehouses for gun limbers and caissons are being erected, and at other points shelters for motor trucks are being put up. It has been figured that this provision for the trucks will cost about \$35 a truck, but it is felt that the expense is fully justified by the preservation of the machines it will effect.

Rim Sizes to be Standardized

AKRON, OHIO, March 28.—At a recent meeting held by the Rubber Association of America, the following standard rims for trucks were adopted:

36 x 6 rim to be used with 36 x 6 tires

38 x 7 rim to be used with 38 x 7 tires

40 x 8 rim to be used with 40 x 8 tires

The plan approved by the Rubber Association is that the present sizes, in addition to what have already been listed, will be furnished as long as there is a substantial demand by the public, but the ultimate result which tire manufacturers desire to obtain is the elimination of sizes other than those above specified. The Miller Rubber Co., commenting on this movement, states that it believes that the trend of the public will be such that it will become fixed in their minds that they can obtain only certain sizes.

This company, as are many other tire manufacturers, is impressing upon the car manufacturers the advisability of the discontinuation of certain sizes, and when making up new specifications for cars the rims, as above mentioned, should be used. This will eliminate the odd sizes as the cars become worn out, all new cars having the standard rims.

The Victory Liberty Loan

Six billion dollars of prosperity insurance is about to be offered to the American people by the United States Government in the shape of the Victory Liberty Loan, the campaign for which will start April 21st and close May 10th.

In conference with men whose business and professional interests require them to keep close tabs on the pulse of America, the Treasury Department has decided that two words shall constitute basis of appeal for forthcoming issue of securities—patriotism and prosperity.

Patriotism means the keeping of promises to the sixty thousand Americans dead. America must make good by supporting the Victory Liberty Loan. The appeal for prosperity is as well founded. Particularly to men interested in any phase of the phenomenal development of the commercial car, it should be obvious that the first essential in any program of reconstruction is the payment of war debts, including the settlement of war contracts.

In the Third Federal Reserve District alone more than \$25,000,000 has been expended for this purpose since the signing of the armistice. An equal amount is to be disbursed in a few months. It is capital for peace-time production.

Without it all the great national, state and county plans for road improvement will be of little value to the commercial car industry.

Trucks to the Fore in Brooklyn

BROOKLYN, April 9.—After a most successful passenger car week the lighter cars have given way to the motor truck, for on Tuesday evening, April 8, the annual commercial car show of the Brooklyn Motor Vehicle Dealers' Association opened, and will continue until Saturday night. The 23rd Regiment Armory houses the exhibits of twenty-six different truck dealers, to say nothing of a goodly number of accessories. The truck dealers are showing twenty-eight different makes, not including adapters or converters.

As usual, the Brooklyn show has a comprehensive display of bodies, and these will be exhibited on chassis and separately. Bodies to meet every requirement are shown, and some of the dealers are exhibiting types particularly designed for agricultural work.

Among the makes of trucks on display are the Autocar, Dodge, Chevrolet, Signal, Ford, Stewart, Riker, Nash, Peerless, Sanford, Paige, Maxwell, Selden, Oneida, Packard, Rainier, Oldsmobile, Master, Reo, Service, Parker, Schacht, Overland, Wichita, Fulton and Ward La France. Among the accessory exhibits is that of the Sewell Cushion Wheel. The decorations are the same as were used for the passenger car event, and are unusually attractive. Dealers expect a large attendance throughout the week, and big business. The show committee consists of A. E. Randall, chairman; I. C. Kirkham, W. H. Kouwenhoven, C. J. Maxson, W. A. Sellon and A. D. Corwin.

Oregon Mechanics Must be Licensed

SALEM, ORE., March 24.—Senate Bill No. 280, recently passed by the Oregon state legislature, provides for the creation of a "board of auto mechanics' examiners." Those wishing to work as automobile mechanics must appear before this board for examination, and if passed they are licensed, after payment of a fee of \$5. An auto mechanic is defined as "any person who shall work for hire or hold himself out to work for hire upon any automobile or auto truck," and does not include "any person not regularly employed in any garage whose employment requires the use of an automobile or auto truck and whose duties, in part, consist of keeping such automobile or auto truck in repair."

The license is good for a year, and can be renewed at the end of that time. The board is empowered to revoke the license at any time "for incompetency on the part of the holder . . . and for any other good and sufficient cause."

February Exports Show Continued Strength

WASHINGTON, March 18.—Exports continued to show great strength in February, the total reaching \$588,000,000 in value, according to a statement issued today by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

This is a falling off from the record January total of \$623,000,000, but as there were only 28 days in February, the daily average would appear to be even higher than in January. The total for the month represents an increase of approximately 43 per cent. over the \$411,000,000 for February of last year. Exports for the eight months ended with February were valued at \$4,386,000,000, as compared with \$3,862,000,000 for the corresponding period of the previous year.

February imports are announced as \$235,000,000, a gain over the \$213,000,000 for January, and over the \$208,000,000 for February, 1918. Imports for the eight months ended with February totaled \$1,933,000,000, as against \$1,841,000,000 for a similar period the previous year.

British Import Restrictions to be Reconsidered September 1st

LONDON, March 10.—Sir Donald Maclean, the Liberal leader in the House of Commons, today asked for a definite statement concerning the trade policy of the British Government.

Sir Auckland C. Geddes, Minister of National Service and Reconstruction, answering Sir Donald, said the policy of the Government was that no import restrictions should continue to be imposed on goods coming from any part of the empire without the consent of the War Cabinet, or on raw materials required for the industries.

Manufactured articles would be subject to restrictions until the first of September, Sir Auckland continued, when the case would come up for revision. There would be no restrictions, he said, on exports to non-blockade countries, except on foods required for naval and military purposes or home consumption or manufacture. The Government, he declared, hoped this policy would enable the country's trade to recover and become greater than ever in the past.

Direct international conferences between the business men actually concerned are being held by the American Chamber of Commerce in London, in order to solve the deadlock in Anglo-American trade produced by the new restrictions.

This method of reaching agreements has the full support of the American Chamber in London, on the ground that it exactly agrees with the experience of the Americans who have been responsible for the sale in Great Britain of hundreds of millions of dollars worth of goods in the past years.

The essential points in holding these conferences, the Chamber reports, are:

Carefully prepared facts and proposals from each side, a clear statement of the principles of international business co-operation and a competent chairman.

Conferences will be held in all trades affected by the restrictions.

Foreign Trade Bureau in Holland Co-operates With Manufacturers

AMSTERDAM, March 18.—The Bureau voor Handelsinlichtingen, or Office for Foreign Relations, expresses its willingness to co-operate with importers or exporters, and will supply information concerning addresses, statistics, etc., free of charge to any firm, who will supply three references, one from the applicant's bank and two from well-known commercial or industrial firms.

The Bureau gives the following information as to its policy:

If articles are wanted from Holland or its colonies, exact specifications of such articles are necessary.

Commission houses, merchants and agents who want to represent Dutch firms abroad are requested to inform the Bureau of those articles in demand in their market.

If articles are offered to buyers in Holland or its colonies, samples or catalogues of the offered articles should be sent to the Bureau (freight and duty paid).

The Bureau places its rooms at the disposal of foreign visitors who are recommended by their respective consulates.

The Bureau does not give information regarding the financial status of firms.

Inquirers should enclose postage for reply when addressing the Bureau, and correspondence should be addressed to O. K. Onnes, director, Handelsinlichtingen, Amsterdam, Holland.

Some Points in British Road Transport Reconstruction

Industrial organizations in the United Kingdom are devoting a large share of attention to reconstruction plans. In the domain of the commercial car, the attitude of the Commercial Motor Users Association is typical. Their reconstruction program includes the following points:

Earliest possible abandonment of fuel restrictions.

Pressure to secure lower fuel prices.

Insurance of uniformity in specifications of gasoline and benzol.

Encouragement of home-produced fuels, free of duty.

Simplification of the procedure for the recovery of fuel tax by commercial car users.

Automobile and fuel taxation to be devoted to road improvement.

Better roads and bridges.

Opposition to unjustifiable road and bridge restrictions.

Better organization to eliminate loading delays at docks, wharves, warehouses and freight yards.

Adequate lighting regulations for all road users.

No local tolls.

Speedy and inexpensive appeal procedure against decisions of local councils.

Active propaganda work in Parliament.

Simplification of automobile and road law.

General Australian Import Prohibition Denied

WASHINGTON, March 18.—Rumors have been circulated that the Australian Government had placed a prohibition upon all imports except of British origin, and in order to secure authoritative information the American commercial attaché in Melbourne was instructed to report on the subject. A cablegram, dated March 12, has been received from the commercial attaché, stating that the prohibition applies only to dye-stuffs. A few prohibitions on importation, applying mostly to articles of luxury, which were adopted during the war, are still in force, but the statement of the commercial attaché indicates that there has been no general change in policy.

Foreign Trade Committee Organized at Washington

WASHINGTON, March 26.—A committee which will provide advisory and supervisory machinery for further extending and developing the business interests of the country in foreign channels, was formed at a recent meeting, attended by representatives of the State, War, Navy, Treasury, Commerce, Agriculture, Labor and Post Office departments, the Shipping Board, War Trade Board, Federal Trade Commission, Tariff Commission, Railroad Administration and Interstate Commerce Commission.

The committee will include representatives of all the governmental offices which deal in any way with foreign trade matters.

A sub-committee on organization was created, with Julius G. Lay, acting Foreign Trade Adviser of the Department of State, as chairman.

Spanish-American Bureau of Information Aids Exporters

The Spanish-American Bureau of Information, with headquarters at 1265-69 Broadway, New York City, announces its willingness to co-operate with manufacturers desiring representation in the Latin-American countries.

The Bureau prepares a monthly report, on which are listed the names and addresses of American manufacturers, their commercial standing and the product which they desire to sell in Latin America. The Bureau does not accept any commission for this service.

Gray & Davis Makes up Accrued Dividends

BOSTON, MASS., March 27.—Directors of Gray & Davis, Inc., have voted to carry out the agreement made in February, 1918, with the preferred stockholders' committee, by which the company was to retire all stock deposited with the committee appointed for that purpose whenever it had sufficient funds not essential to the conduct of its regular business, explicit provision being made that the preferred must be retired before common dividends were inaugurated.

On April 1 all preferred stock deposited with the committee was purchased at 103 a share, and accrued interest. Amount of stock on deposit with the committee at the time of the directors' vote was approximately \$440,000, out of \$600,000 outstanding.

Service Motor Truck Establishes Airplane Delivery

WABASH, IND., March 27.—The Service Motor Truck Co., Wabash, Ind., has arranged with the Service Aviation Training & Transportation Co. to furnish rapid aerial distribution of repair parts and other unusual service demands to distributors and service stations of the Service company, located in all parts of the United States, as well as to users of Service trucks who may be engaged in overland hauling.

The aerial service will be handled under contract by the Service Aviation Training & Transportation Co., a separate organization formed by stockholders of the Service Motor Truck Co. J. P. Porter, the chief pilot, was formerly of the Royal Flying Corps, London, and was one of the chief instructors at Love Field Aviation Camp, Texas. The assistant pilots are Harold C. Brooks and V. P. Hollingsworth, both of whom were formerly associated with Chief Pilot Porter. Oscar Bricker, formerly of Love Field, is in charge of the hangars and landing field.

A forty-four acre field has been prepared exclusively for landing, and the construction of hangars has been completed. Curtiss J. N. 4 planes will be used.

Wilson to Rebuild Body Plant

DETROIT, MICH., March 16.—At a meeting of the stockholders of the C. R. Wilson Body Co., it was agreed to rebuild a new plant on the site of the one recently burned, and \$500,000 was appropriated for the new building. Three stories are being added to the plant which was in process of completion when the fire occurred. The company's business for January exceeded \$600,000, and orders received so far for 1919 call for delivery of 63,000 bodies.

Officers were re-elected as follows: C. R. Wilson, president; George D. Wilson, vice-president; C. Haines Wilson, secretary and treasurer.

B. F. Everitt Offers New Differential

DETROIT, March 30.—B. F. Everitt, of Detroit, is putting on the market through the B. F. Everitt company, the Elbertz differential. This device has only four gears, of the spur type, two being internal. The construction of the mechanism allows for the transfer of a proportionate amount of power to the wheel having traction when one of the drivers tends to slip. It is claimed that, when this device is installed, either wheel will take approximately 80 per cent. of the total power applied to the propeller shaft.

Lockwood-Ash Extends Plant

JACKSON, MICH., March 24.—The Lockwood-Ash Motor Co., owing to increased demand for its spark plugs, has found it necessary to increase its manufacturing facilities by the erection of additional buildings, in which the most modern facilities for the promotion of good workmanship are provided.

Arthur L. Lockwood is president of the company; W. L. Ash is vice-president, and F. T. Lockwood is secretary and treasurer.

Reliance Truck Company Reorganized

APPLETON, WIS., March 18.—The Reliance Motor Truck Company announces that there has been a complete reorganization of the company, Mr. Ira L. Miller having withdrawn. The new officers are as follows: J. M. Balliet, president; M. Weyenberg, vice-president; A. G. Brusewitz, secretary and treasurer; B. H. Smith, sales manager, and Oscar Stegeman, chief engineer.

Readjustment of the production schedule has been completed, and the first trucks are now ready for distribution. The present output will be limited to 1½-ton trucks. The 2½-ton model will be ready for distribution July 1. All Reliance trucks will be equipped with the Badger External Gear Drive Axle.

The Meacham Takes Over New Process Rawhide Department

SYRACUSE, N. Y., March 27.—The New Process Gear Corp. has announced the sale of its rawhide department to the Meacham Gear Co.

The organizers of the Meacham Gear Co. were, until recently, officers of the New Process Gear Corp., and of its predecessor, the New Process Rawhide Co. With the purchase of the rawhide department, the Meacham company obtains the special plant for the preparation of rawhide, and all materials and machinery used in the rawhide department, as well as all processes for making rawhide.

The New Process Gear Corp. will confine its facilities in the future to the manufacture of metal gears.

The Moline-Knight Bonus Extended

EAST MOLINE, ILL., March 26.—Employees of the Moline-Knight factory of the Root & Van Dervoort Engineering Co., have been notified in an announcement by W. H. Van Dervoort, president of the company, that the 12 per cent. war bonus, which went into effect March 20, 1918, for a period of one year, will be continued for at least three months longer than the limit originally set. The bonus is an accumulative one, and is paid after six months of continuous service. All employees are affected, but those whose earnings are in excess of \$2000 a year receive a bonus of lower per cent., graduated down to 5 per cent. for those earning more than \$2250 a year.

American Bosch Magneto Holds First Convention

SPRINGFIELD, MASS., March 25.—The American Bosch Magneto Corporation held recently its first sales convention. The convention was one of executives, branch managers, district supervisors of sales and service and sales engineers from New York, Detroit, Chicago and San Francisco being present.

Tuesday morning, March 25, was given up to an automobile trip, showing interesting points of Springfield; afternoon was given over to inspection of the works, and evening, to departmental business, at various clubs.

Wednesday and Thursday were given over to discussion of trade matters, review of new products, etc.; Wednesday evening, a banquet of the one hundred executives and department heads was held at the Nayasset Club.

Wichita Falls Motor Company Holds Annual Meeting

WICHITA FALLS, TEXAS, March 19.—At the annual meeting of the stockholders and directors of the Wichita Falls Motor Co., officers were elected as follows: J. A. Kemp, who has been president of the company since its organization, was elected chairman of the board of directors; J. G. Culbertson was elected president and re-elected treasurer; A. G. Savelli was re-elected vice-president in charge of export, and G. S. Brenemann was elected secretary.

The company is planning to increase its capitalization to \$1,000,000 in the near future.

Packard Dealers Meet in Philadelphia

PHILADELPHIA, March 22.—Packard branch presidents and dealers met here March 20 and 21 for a conference. Plans for merchandising the normal output of motor cars, and for meeting more effectively the larger transportation problems were the subjects of discussion. The next meeting will be held in Indianapolis, May 28 and 29.

Autocar Offers Bonds

PHILADELPHIA, PA., March 17.—An issue of \$1,800,000, the Autocar Company first mortgage six per cent. serial gold bonds, to be dated April 1, 1919, and maturing in semi-annual installments from April 1, 1919, to April 1, 1925, is being offered at prices ranging from 100 to 97½, according to maturity. The bonds are callable as a whole, but not in part, on 30 days' notice at 102½ and interest until October 1, 1922, and at 101 and interest thereafter. The balance sheet of the company for December 31, 1918, shows net quick assets of over \$2,400,000, and upon the completion of present financing, it is estimated that the company will have net assets of over \$3,200,000. Annual net sales have grown from \$1,017,052.76 in 1909 to \$7,999,394.81 in 1918. The company is paying annual dividends of 10 per cent.

Service Holds Annual Sales Convention

WABASH, IND., March 22.—More than one hundred representatives of the Service Motor Truck Co. gathered recently at the factory for the annual national sales convention.

The convention program included many interesting discussions and addresses. Moie Cook, secretary and general manager, spoke on "General Business Conditions in the Motor Truck Industry." E. T. Herbig, sales and advertising manager; F. C. Gilbert, vice-president of the Timken-Detroit Axle Co., and F. E. Place, general manager of the Buda Co., also delivered interesting addresses.

Entertainment was provided for the time between business sessions, and the convention concluded with a banquet.

Parker Holds Sales Convention

MILWAUKEE, WIS., March 25.—Representatives and district managers of the Parker Motor Truck Co. met recently at the factory to discuss the various problems which the industry will face during the coming year.

The first two days of convention week were devoted to conferences between the sales and engineering departments, during which the selling organization suggested improvements that might be embodied in the design of the trucks.

Other conferences were devoted to discussions of service, production and sales and all present conceded that the convention was a most profitable one.

Ideal Tire Opens New Branch

CLEVELAND, OHIO, March 23.—The Ideal Tire & Rubber Co., of this city, announces the opening of a new branch in Kansas City, from which it will serve the southwestern territory. It will be located at 1929 Main St., and will be under the supervision of S. A. Thompson.

The Ideal Tire & Rubber Co. manufactures the Greyhound tire.

United States Rubber Company Has Profitable Year

CLEVELAND, OHIO, March 27.—The annual report prepared by Samuel P. Colt, chairman of the United States Rubber Co., shows the company to be in a strong position financially, the volume of business for 1918 being in excess of that for the previous year.

The net sales of the company for the year 1918 were \$215,398,425.04, an increase of more than \$39,000,000 over the sales of the previous year. The income from sales, after deducting cost of manufacture, depreciation, property taxes, selling and general expenses, cash discounts allowed customers for prepayment, and adequate reserve for bad debts, amounted to \$39,480,631.83. From which there should be deducted income charges, net, including inventory adjustments and provisions for Federal, Canadian and British taxes .. 19,289,534.86

Thus leaving the net before interest \$20,191,096.97
Less interest, net 4,119,055.41

Net profits for the year...\$16,072,041.56
Dividends paid on United States Rubber Co. pref. stocks\$4,961,992.00
Dividends paid to minority stockholders of subsidiary companies ... 19,509.50 4,981,501.50

Leaving as the surplus for the year\$11,090,540.06

Hess-Pontiac Plant Burns

PONTIAC, MICH., March 24.—The plant of the Hess-Pontiac Spring & Axle Co., a subsidiary of the Standard Auto Parts Co., was seriously damaged by a fire started from an oil burner. The damage is estimated at \$150,000. The destroyed portion of the plant will be rebuilt at once.

GMC to Improve Stretches of Lincoln Highway

The finance committee of General Motors has authorized W. C. Durant to place at the disposal of the Lincoln Highway Association \$100,000, to be expended in completing roadways across the only two remaining bad stretches of the Lincoln Highway.

The GMC stretch will be in Nevada, one of 12 miles near Fallon, known as the Fallon sink, and the other of eight miles near New Pass, on the main road to Reno. With these two stretches completed, along with those portions of the highway now being improved with contributions from F. A. Seiberling, John N. Willys and Carl G. Fisher, the roadway from Cheyenne, Wyo., to Reno, Nev., will be good going.

Peerless Discontinues Truck Line

CLEVELAND, OHIO, March 18.—The Peerless Motor Car Co. announces its intention of discontinuing its manufacture of trucks, and will devote its facilities in the future to the manufacture of passenger cars. Attention will be concentrated, for the present, upon the eight-cylinder model. The production of truck parts will be continued however, in order that service may be rendered to Peerless truck owners.

J. H. Malone Leaves Chilton Company

James H. Malone, who for the past nine years has been advertising manager of the Chilton publications, leaves the company with the good-will and regrets of all of his old associates, to become vice-president and general manager of the William F. Hudson enterprises, 1932 Arch St., Philadelphia. This firm comprises the Hudson Motor Axle Co., the Hudson Motor Specialties Co., Precisions Thread Grinder Manufacturing Co., and Hudson Peck Machine Products Co.



New Vim Service Station at Cleveland

Over \$25,000 of parts are kept on hand at the new Vim service station at 3305 Croton Avenue, Cleveland. Twenty-four hour service is maintained at this station, which is under the supervision of T. H. Hillman, service manager.

Standard Traffic Rules Adopted

The National Highways Traffic Association Votes for Regulations
Compiled by Highways Transport Committee of
Council of National Defense

NEW YORK CITY, March 22.—The National Highway Traffic Association met here last night and went on record as favoring the adoption of standardized traffic regulations. The members passed a resolution calling for the adoption of the rules compiled by the Highways Transport Committee of the Council of National Defense, as standard for their association.

Hon. Francis M. Hugo, secretary of the State of New York, was the guest of honor. He talked on the "Qualifications for Operators of Motor Vehicles, and Revocation of Licenses," stating that when he took office in 1915, there were only 150,000 motor vehicles registered in the state, as compared with more than 465,000 at the end of 1918. He predicts that 1919 is going to be the greatest year in the history of the automobile industry, and estimates that more than 550,000 cars and trucks will be registered in New York State before 1920. With the fees collected from the owners, 175,000 chauffeurs and 125,000 operators, the state income from this source will be more than \$6,000,000 this year.

Traffic, Mr. Hugo pointed out, is the biggest problem in municipal administration today, and traffic regulation is really a matter of good citizenship. During 1918 there were 1152 deaths on the 90,000 miles of roads and streets in New York State. Mr. Hugo intimated that a large proportion of these accidents, besides many more less serious ones, were due to the fact that in New York State anyone who can buy a car can run it, without violating the law. For this reason he advocates requiring every new registrant to pass an examination of the same kind now required for chauffeurs to prove his or her proficiency in handling a car under all kinds of conditions.

Education of the pedestrian is another prime essential in Mr. Hugo's opinion and he has been conducting a campaign to have children in the schools of the state taught the fundamentals of traffic rules, even going to the trouble of having a special moving picture "thriller" made to show the dangers of the street and road.

Dr. Shirley W. Wynne, Assistant Registrar of Records, Department of Health, New York City, spoke on "Regulation of Pedestrian Traffic," stating that in New York City deaths in traffic accidents outnumber those from a number of malignant diseases combined. In his opinion, this is due to overcrowding resulting from the modern tendency toward centralization. In 1899, he said, only three persons to every 10,000,000 of the population were killed by automobiles in New York; in 1916 the number killed by automobiles was 915 per 10,000,000 of population. But it is significant

to observe that the percentage of accidents was 629 per 1000 cars in operation, whereas in 1916 it was only 1.27 per 1000 cars in use. This decrease he attributes to the regulation of motor vehicle traffic. At the same time, up to the present, pedestrians have not been regulated and to show that most accidents are due to this fact, he cited some figures from police department records. Of a total of 10,500 accidents investigated, it was found that only 800 were caused by carelessness of the driver and only 700 by defects in the mechanism of the vehicles, whereas 9000 were directly traceable to carelessness on the part of the pedestrian, and 3000 of these were cases where the pedestrian crossed the street in the middle of the block. Dr. Wynne advocates legislation prohibiting pedestrians from crossing streets except at street intersections. He also considers it essential that steps be taken to keep children off the streets where traffic is allowed to pass.

Elmer Thompson, Secretary of the Automobile Club of America, and also of the National Highway Traffic Association, was scheduled to speak on "Sign Posting for Detours, and Through Routes in Municipalities," but asked that this talk be deferred to another occasion in order to give immediate attention to the proposed standard traffic regulations. These were presented by Mr. William P. Eno, Chairman of the Highways Transport Committee of the Council of National Defense, who submitted a resolution calling for their adoption by the association. This was passed.

An informal dinner preceded the meeting, in accordance with the custom of the association, and the proposed rules were discussed by the members.

Engineering Advertisers' Association Formed

CHICAGO, March 20.—Advertising and sales managers representing manufacturers in various engineering lines have felt the need of an association where free discussion might be given various problems that arise in their field of endeavor, and also permit means of friendly interchange of ideas and business methods pertaining to the advertising and selling of engineering products.

With these objects in view, the Engineering Advertisers' Association was organized in Chicago, March 11, at the Hotel La Salle. At that meeting some of the leading manufacturers of engineering products were represented, a constitution and by-laws adopted, and officers and directors elected as follows:

President, H. L. Delander, advertising manager, Crane Co.; vice-president,

H. Colin Campbell, director advertising, Portland Cement Association; secretary, G. H. Eddy, publicity manager, Green Engineering Co., East Chicago, Ind.; treasurer, Edward J. Pratt, advertising manager, Kellogg Switchboard & Supply Co.

The Engineering Advertisers' Association will be dominated by its active membership, although provision is made to accept as associate members publishers and their representatives, solicitors and service agency men whose interests are confined to engineering projects. Active membership, however, can be enjoyed only by those in responsible charge of advertising or sales of the companies with which identified. Regular meetings of the association will be held monthly except during July and August, the annual meeting being held in March. Speakers of recognized prominence in the field of engineering advertising will give addresses on the subject of general and special interest to members at various meetings.

Electric Furnace Association Formed

NIAGARA FALLS, N. Y., March 23.—At a meeting called by Acheson Smith, vice-president and general manager of the Acheson Graphite Co., on March 21 and 22, the organization of an association to promote the use of electric furnace products was perfected.

Resolutions were passed at the meeting inviting all manufacturers of electric furnaces, electrical apparatus, electric furnace supplies and accessories, public utility corporations, designers and inventors of electric furnace equipment, and users of electric furnaces, to become members and to join in a campaign to disseminate accurate data as to the quality of electric furnace products of all kinds. The organization is to be known as the Electric Furnace Association.

Officers of the association were elected as follows: Acheson Smith, president; C. H. Booth, Booth-Hall Co., Chicago, first vice-president; W. E. Moore, Pittsburgh Electric Furnace Co., Pittsburgh, second vice-president; C. G. Schluederberg, Westinghouse Electric Mfg. Co., Pittsburgh, secretary; F. J. Ryan, American Metallurgical Corp., Philadelphia, treasurer. Directors include the officers and C. A. Winder, General Electric Co., Schenectady and F. J. Tone, Carborundum Co., Niagara Falls.

Ohio Will Tax Overloads

COLUMBUS, OHIO, March 17.—A law levying heavy penalties on motor truck owners who carry excess loads and who travel at an excessive speed over Ohio highways is being prepared by the Ohio State Legislature.

Ohio has a law limiting the weight of trucks and loads to 12 tons, and the legislature is determined to see it observed.

Vermont Truck Men Protest Motor Truck Bill

MONTPELIER, VT., Mar. 18.—At a public hearing recently in Representatives' Hall on H. 254, a bill having to do with regulation of weights, sizes and rates of registration of motor trucks, a number of speakers, including F. W. Fenn, of the Motor Truck Committee of the National Automobile Chamber of Commerce; W. S. Teachout, chief clerk of the Vermont state automobile department; A. L. Fenner, of the International Motor Co., and A. O. Gates, Vermont representative of the Standard Oil Co., gave their views concerning the measures of the bill.

It was the general opinion that registration rates provided for in the bill were altogether too high, and regarding taxes the point was brought out that it seemed unfair to tax a light truck more than a heavy touring car.

Commissioner Stoddard B. Bates, of the highway department, maintained that a six-ton limit in weight ought to be made, and said that it would be impossible to build roads in Vermont for several years which would stand up under a load of fifteen tons, such as had been suggested. Farmers and truck owners agreed that loads should be regulated until proper bridges could be built.

Mr. Fenn suggested that the method of taxation be based on the standards embodied in the speech of Geo. M. Graham, and printed in pamphlet form by American Automobile Association.

Uniform Motor Vehicle Laws Needed in Illinois and Iowa

ROCK ISLAND, ILL., March 25.—Conflicting motor vehicle regulations are creating much annoyance to owners of cars and trucks which move back and forth between Rock Island and Moline in Illinois, and Davenport, Iowa. The three cities are located on the banks of the Mississippi river and there is a steady movement of power vehicles across the bridge. Rock Island authorities are strictly enforcing the Illinois laws and have made numerous arrests, due to the fact that the cars and drivers are not carrying the proper license. Louis G. De Armand, traffic commissioner of Davenport, has decided to retaliate in kind, and all vehicles owned outside of Iowa, must carry Iowa license plates if they enter the limits of that state. All chauffeurs of such vehicles who drive in Iowa must also carry the proper license. The law with reference to license plates on cars, applies only to corporations. Vehicles owned by unincorporated firms or by individuals may be operated in Iowa under the same regulations as apply to passenger cars, carrying the single plate of the state in which it is licensed.

Enforcement of the Illinois laws was commenced a year ago and warning sent to all outside concerns that they must

comply with the Illinois laws. For a time, this was done, but of late, with a laxity of inspection, trucks from Iowa have been coming into Illinois without licenses and this has led to another campaign of prosecution. An effort is being made to secure uniform laws governing motor vehicles in both Illinois and Iowa at the sessions of the legislature this year and thus prevent the confusion now existing.

University Course in Highways Transport

ANN ARBOR, MICH., March 28.—A new course, designed to train an army of experts to direct the coming great expansion in road building and highways transportation, is announced by the University of Michigan. It is believed that thousands of men who have been trained by the army in the haulage of freight over the roads will want to round out their education by going back to college as preparation for making highways transportation their life work.

Many other students also have indicated their desire to enter this new field of endeavor, and these, with the former army men, will make up the first classes. The students will take up automobile engineering and various phases of the transportation question as presented by the department of economics and highways engineering, as it is now recognized that the road-bed and the highway vehicle that travels it are as closely related as the rolling stock and the road bed of the railway line.

With the Federal Government contemplating the expenditure of \$500,000,000 this year on the highways, and with many states already preparing to spend lesser sums, the men necessary to direct the work are needed. Other universities, it is believed, will follow the example of the University of Michigan in offering training along these lines next fall.

Report of Bureau of Mines Shows Vast Increase in Gasoline Production

WASHINGTON, March 24.—A special report, prepared by Van H. Manning, Director of the Bureau of Mines, on the response of America to the war call for materials, is highly informative as to the increase in production of gasoline brought about by war demand.

In 1916, before the United States entered the war, according to this report, the production of gasoline was a little short of 50,000,000 barrels. In 1917 the production, accelerated by the entry of the United States into the war, increased to 68,000,000 barrels, an increase of more than 50,000 barrels a day. In 1918 the output exceeded 85,000,000 barrels.

Export figures show that in 1916, 8,473,102 barrels of gasoline were sent abroad. In 1917 this amount reached 9,901,877 barrels, and in 1918, 13,312,508 barrels were exported.

New York May Have Highways Transport Day

ALBANY, N. Y., March 20.—F. W. Fenn, of the Rural Motor Truck Express Bureau of the National Automobile Chamber of Commerce, is authority for the statement that Governor Smith, of New York State, has expressed his willingness to issue a proclamation granting a Highways Transport Day for the State of New York.

In some states the State Highways Transport Committees have passed out of existence, and in others they are becoming part of the state government. It is possible, that in New York State, a paid secretary will handle the work formerly done by the Highways Transport Committee.

Governor Allen, of Kansas; Governor McKelvie, of Nebraska; Governor Cox, of Ohio; Governor Sleeper, of Michigan, and Governor Harding, of Iowa, have also pledged themselves to retain their Highways Transport Committees, and it is possible that a Highways Transportation proclamation will be issued in Ohio, Missouri, Kansas, Nebraska and Iowa, as well as in New York State.

Boston Still Debating Question of Truck Fees

BOSTON, March 27.—After a spirited hearing before the Committee on Roads and Bridges today, at which representatives of the Boston Commercial Motor Vehicle Association and others pointed out that the proposed bill for taxing trucks was too drastic to even admit of consideration, a compromise was reached; that is, a committee of the association and the Highway Commission agreed to meet and thrash out the matter.

The original bill introduced imposed a heavy tax on trucks, and its terms virtually barred trucks of 5-tons capacity and over. By its terms the owner of a 7½-ton truck would be compelled to pay a license fee of \$1000. Another bill, supplementing the one mentioned, proposes a fee of \$100 on a 5-ton truck, and \$200 additional for each ton and fraction thereof in excess of 5 tons. It is said that the dealers and owners will sanction a reasonable increase, if it be shown to be necessary, but will oppose any drastic legislation. The result of the conference is awaited with much interest, owing to the attitude of the leading member of the Highway Commission and some of the dealers who do not handle trucks of a capacity exceeding 5 tons.

Detroit Motor Parts Co., recently organized at Detroit, has established offices at 212 New Telegraph Bldg. The company has a capital stock of \$40,000, with \$20,000 paid in. Piston rings and shafts of all descriptions for cars, trucks and tractors will be manufactured. Officers of the company are: E. F. Wilkinson, president; F. M. Keeton, vice-president, and R. B. Merrill, secretary-treasurer.

Beefsteak Dinner Enjoyed by Motor Truck Association

NEW YORK CITY, March 20.—The Motor Truck Association of America held its annual beef-steak dinner on March 19, at Churchill's, New York, and about 150 members of the association joined in the celebration. As the name implies, gastronomic art was the master-key through which good fellowship was raised to the n-th power. Every man of those present thoroughly enjoyed the beefsteak-and-cabaret affair, and when the two-hour symposium ended, the crowd was in a receptive mood.

Then, Mr. Geiger, of the Peter Doelger Brewing Co., introduced several speakers, each one well known to most of the men present. Every speaker gave a short talk—pithy, interesting and mostly humorous.

Major George Greene, attached to one of the British tank corps since its organization, insisted that he could not talk about the war, but nevertheless entertained the members by telling about several intimate experiences. By way of illustrating the devotion often shown by men toward each other, he told about two generals whom he took into the firing zone. It was their first experience, and after witnessing the arrival and effect of a few shells, each of the two officers was so worried about the safety of the other, that both agreed to withdraw their persons from that particular spot.

Captain Stevens, after a little song, drove home the point that whatever knocking may now be heard, it generally comes from men who don't know what they are talking about, that there is no occasion to believe them, and that the proper thing to do to a knock is to "kill it dead."

The good work of New York State legislators was the subject of Assistant Secretary of State Parker's words. He pointed out the difficulties of the position in which legislators often find themselves, and said that they deserve credit for overcoming them and pushing through legislation fair to motor vehicles.

Acting Police Commissioner Harris, of New York City, added to the merry spirit of the meeting by a few amusing anecdotes which were generally relished by those present.

Speaking of the value of organized action, W. H. Brady, past president of the New York Rotary Club, called attention to the need of close co-operation among truck dealers and users in the work of educating the public toward efficient utilization of commercial vehicles and the procuring of sensible legislation which alone can insure greater service by such vehicles. Drawing upon the stock of his experience as a lawyer, he related several instances where organized effort had brought about progress and efficiency, in spite of strong opposition, and he said that such an organization as the Motor Truck Association could and must render useful work of nation-wide importance.

In closing the evening, Mr. Geiger remarked upon a still widespread tendency on the part of many daily newspapers to place commercial car traffic in a wrong position. Statistics regarding accidents are often quoted in a misleading manner, leaving out mention of such factors as number of population, perfection of municipal organization, etc. It is up to the members of the M. T. A. and kindred organizations, Mr. Geiger declared, to educate the public regarding such mis-statements, and explain that the preoccupied minds of pedestrians during wartime were largely responsible for an increased frequency of accidents in certain localities. But reports of accidents are not the only information thus misused by opponents of motor trucks, and there is need of acquainting the general public more closely also with the possibilities of service which commercial cars offer.

H. W. Perry Appointed Manager of the Trailer Manufacturers' Association

DETROIT, March 19.—Twenty trailer manufacturers were represented at a meeting of the Trailer Manufacturers' Association of America, held in Detroit, March 18. Many subjects were discussed, one of the most important being an extensive publicity campaign on trailers.

To handle the campaign, all members subscribed liberally to the publicity fund, which reached a considerable amount, and all indications point to an aggressive campaign. The association engaged the services of H. W. Perry, who was formerly connected with the National Automobile Chamber of Commerce. Mr. Perry has had considerable experience on automobile subjects, and has likewise established numerous points of contact with governmental activities which will be advantageous to the association.

The general offices of the association and manager will be located in New York City, as soon as favorable quarters can be secured.

Announcing Our "Washington Service Bureau"

This is to announce that we have established a service bureau which will be pleased to answer questions and furnish information by mail on the following:

Foreign and domestic traffic rates.
Credit ratings on foreign firms.
Market conditions, foreign and domestic.
Lists of buyers anywhere in the world.
Names of manufacturers throughout the world.
Contact agency for communication with specific foreign markets.
Information on foreign patents and trade marks.
Information on protection of trademarks in foreign countries.
Foreign trade opportunities.
Personal interviews with returning consuls, commercial attaches, and trade commissioner.
Personal contact with embassies, legations, and commercial missions of various countries.
Activities of Pan-American Union and International High Commission.
Legislation pending in Congress.
Copies of Congressional hearings.
U. S. Supreme Court decisions and decrees.
Treasury Department rulings.
Statistical compilations of exports and imports.
Copies of special government reports.
Special reports on activities of the Federal Trade Commission which interest you.
Hearings of Interstate Commerce Commission.
Research work at Congressional Library.
Activities of Railroad Administration.
Copies of government specifications requesting various bids.
Labor and employment conditions covered.
Shipping conditions.

We have inaugurated this service, which is offered gratis to our readers, for the purpose of placing our readers in closer touch with Washington affairs. Communication on any of the above subjects should be sent to the Chilton Company, 49th and Market Sts., Philadelphia, Pa. "Washington Service Bureau."

Madison Motors & Tractor Corp., Anderson, Ind., has been formed, with a capitalization of \$1,200,000, and will make tractors and trucks. This corporation is an outgrowth of the merger of the Bull Tractor Co., of Minneapolis, and the Madison Motors Corp., of Anderson. C. E. Gibson is president.

Motor Vehicles Delivered to Army and Per Cent Remaining on Order. Status February 1, 1919

Type	Total orders less cancellations	Delivered	Remaining on order	Per cent. of ordered	
				Delivered	Remaining
Trucks:					
Light delivery and repair	13,209	13,209	.....	100	..
A, 1½ to 3 ton	17,413	15,084	2,329	87	13
B, 3 to 5 ton	45,239	37,891	7,348	84	16
T. F. W. D., 2 to 3 ton	29,232	24,095	5,137	82	18
AA, ¾ to 1 ton	10,044	6,272	3,772	62	38
Motor cars	20,038	20,037	1	100	..
Ambulances	14,073	13,321	752	95	5
Motorcycles	39,239	36,832	2,407	94	6
Trailers	*27,223	23,913	3,310	88	12
Bicycles	38,917	33,217	5,700	85	15

* Not including 4,847 Ordnance Department trailers.

Distribution of Vehicles Delivered

Type	Overseas	In United States	Per cent. of total delivered	
			Overseas	In United States
Trucks:				
Light delivery and repair	10,849	2,360	82	18
B, 3 to 5 ton	21,388	16,503	56	44
T. F. W. D., 2 to 3 ton	11,782	12,313	49	51
A, 1½ to 3 ton	6,235	8,849	41	59
AA, ¾ to 1 ton	1,530	4,742	24	76
Bicycles	28,419	4,798	86	14
Ambulances	8,633	4,688	65	35
Motorcycles	22,133	14,699	20	40
Motor cars	9,193	10,844	46	54
Trailers	5,949	17,964	25	75

Gear Makers to Meet at Cleveland

CLEVELAND, OHIO, April 14.—The American Gear Manufacturers Association is holding its annual convention at the Hotel Statler, Cleveland, Ohio, April 14, 15 and 16.

The organization includes in its membership representative companies engaged in making gears in the United States and Canada. For some years past this association has been striving earnestly to effect an organization that would develop definite means for standardizing its products. The present convention will center its attention on this problem.

Papers will be presented as follows: "Gear Steels," by Dr. Parker, of the Carpenter Steel Company; "Proper Sizes and Materials for Gears," and "Worms and Worm Wheels," by a representative of the Timken-Detroit Axle Company.

George D. Roberts Advertising Manager for Chilton

George D. Roberts, who for the past six years has been the manager of the Chilton Service Department, has been made advertising director of the Chilton publications. Mr. Roberts is a man of long experience in the advertising field and previous to his connection with the Chilton Co. was advertising manager of C. J. Heppe & Sons, Philadelphia.

New Jersey Automobile Men Hold Annual Meeting

NEWARK, N. J., March 30.—Three hundred members of the New Jersey Automobile Trade Association met last night at the Robert Treat Hotel for their annual dinner.

W. Eugene Turton, of the legislative committee of the Association, gave a report of the work accomplished by his committee in the correction of legislation harmful to the trade. Mr. Turton said that there would be no repeal of the garage lien law, but that certain needed changes would, in all probability, be made next year. The bill designed to protect car owners from theft will be passed, Mr. Turton believes, but the bill which would require a filing of statements on the sale of all used cars has been withheld, pending further study, in order that it may not be too cumbersome, and to make it serve fully the purpose of prevention of fraud in used car sales. The committee is now devoting its attention to the federal tax decision, and will assist members in the interpretation of Washington rulings.

A successful financial year was reported for the association, and officers for the coming year were elected as follows: John C. Bell, president; Clarence E. Fisher, vice-president; John B. Stobaue, secretary, and R. A. Green, treasurer.

The W-J Truck Soon to be Introduced

BOSTON, MASS., April 4.—The Walker-Johnson Truck Co., of East Woburn, Mass., is soon to put on the market the W-J truck, which is now in process of manufacture. A large plant has been built, and W. J. Walker, general manager of the company, plans to market his product direct from the factory. Mr. Walker states that, by building his factory near Boston, he hopes to eliminate delays in delivery.

United Kingdom Has Twenty Million Gallons of Gas

LONDON, March 16.—It is announced by the British Board of Trade that, apart from aviation and military transport spirit held by the British War Office, there were in the United Kingdom at the end of February, 20,000,000 gal. of gasoline available for public use. This represented only the amount imported by the Government as sole importer, and was in addition to other stocks belonging to traders.

In the March issue of the COMMERCIAL CAR JOURNAL, page 24, the name of A. B. Warman, president of the Maccar Truck Co., of Scranton, Pa., was inadvertently mis-spelled.

Activities of the Motor Truck Association of Philadelphia

OFFICERS

T. K. QUIRK
President

J. HARRY SCHUMACKER
Vice President

W. ROSS WALTON
Treasurer

W. H. METCALF, Sec'y
328 N. Broad Street



BOARD OF GOVERNORS

LEE J. EASTMAN O. W. DOOLITTLE E. R. WHITNEY
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J. D. HOWLEY

COMMERCIAL CAR JOURNAL OFFICIAL ORGAN

The importance of carefully watching adverse motor truck legislation at Harrisburg and in the Philadelphia City Councils, was again emphasized at the monthly meeting of this association, on March 26th, at the Hotel Adelphia. Attention was called to a bill introduced during the past week at Harrisburg requiring pneumatic tires on all motor trucks in this state, and another bill pending in Philadelphia Councils on the question of "parking on Broad Street and other streets of the city." The latter bill was brought up by the Traffic Committee's report, and was objected to on the ground that it forbids parking of cars anywhere throughout the length of Broad Street. Both bills were referred to the Board of Governors.

Secretary Metcalf reported for the Legislative Committee that conferences with Harrisburg legislators on the Dithrich and Buckman Bills had resulted in a practical agreement on 26,000 lb. as the maximum weight for motor trucks, a length of 26 ft. and a width of 90 in. He said that the committeemen were assur-

ed that the truck industry would be treated fairly. Mr. Metcalf also reported for the Show Committee, that the motor truck show had a paid attendance of nearly 9000, which was three times as great as any former truck show here, and was larger than the attendance at the New York Show. He also reported that he had attended an organization meeting of the Lancaster County Motor Truck Association, which was formed with a representative membership, and had elected Edward Stimson, a former Philadelphian, president. They had agreed to co-operate with the Philadelphia Association, and others in the state, on securing satisfactory legislation to the motor truck industry.

Clarence P. Wynne, former president of the Philadelphia Aero Club, advocated the provision of a public airplane landing field at League Island Park, or some other location centrally located, and suggested that before long airplanes would be conducting a commercial business on a large scale between all large cities.

Thos. Shallcross, Jr., president of the Kiwanis Club, and former president of the Philadelphia Real Estate Board, spoke on the "Own a Home" week campaign. Congressman Wm. S. Vare assured the members that he was confident Governor Sproul and the Legislature would not approve of legislation injurious to the motor truck industry, and referred to the Governor's extensive interests in many counties throughout the state as a guarantee of his favorable attitude toward good roads and automobiles.

C. A. Musselman, chairman of the Committee on Reception for the National Association of Motor Truck Sales Managers' Convention, to be held here on April 11th and 12th, invited the dealers present, and owners of trucks as well, to participate in the banquet and open business session, to be held on April 12th.

R. Arthur Bittong, chairman of the Entertainment Committee, provided a most interesting entertainment for the evening.

Insurance Discussed by Motor Truck Club of New Jersey

THE Motor Truck Club of New Jersey, which, by the way, is rapidly increasing its membership, is considering the advisability of some form of insurance for those members who are truck owners and operators. The club members believe that it is practical to form an insurance organization, and that, not only would a much lower rate be probable, but many benefits would accrue.

At the monthly meeting, which was held at Paterson, N. J., March 18, so that the members could attend the automobile show in that city, the members were addressed by T. C. Moffatt, an insurance expert, who discussed the various forms of insurance and their application to commercial cars. After describing the history of insurance from its inception, and defining the various methods, he discussed the mutual plan, which was under consideration by the club.

"Mutual companies are incorporated, and pay dividends in percentages, based upon the judgment of the Board of Directors and management as to the rate of dividend, and depending, for unusual losses, upon assessment on the policy holders; the policy itself acting as the contract, for collecting of assessment, if necessary," said the speaker. "It is interesting to note that mutual companies cannot legally collect from their policy holders, except in the state in which they, the mutual companies, are domiciled, or regularly licensed. Thus, a New Jersey policy holder or a Massachusetts mutual cannot legally be compelled to contribute to other insurer's losses, unless he happens to have assets in the State of Massachusetts.

"While this might guard the New Jersey resident against assessment, it would also materially weaken his indemnity, because the same is true of policy holders in other states. The majority of life insurance companies are operated under mutual plan, which for that class of indemnity has been most satisfactory. The underlying reason for this is that every policy issued is based on the positive fact that a man will die, and the premium is based upon the payment of a "total loss," under the contract. The expectancy of man is a known factor, and the rates are thus easy to determine. This, of course, is not true of fire or liability, and the element of variation makes it almost impossible to determine the rate which should be charged to secure protection and leave the company financially strong.

"In special lines mutual or reciprocal insurance lends itself most admirably, and is more flexible and better adapted than stock insurance. I know that you gentlemen feel that automobile rates are too high, and I am not prepared to agree or disagree with you, because I do not know, and nobody else knows what the

cost of this business is going to be for the next year.

"Stock companies make money on the investment of their assets which they, themselves have paid in, and in addition, the premiums which have not yet been expended for losses incurred, expense, etc., and it is just as necessary, but not always legally so, for the mutual or inter-insurance concern, to do the same thing. For example: Suppose you form an inter-insurance organization and the first year secure premiums to the extent of \$100,000. The losses, we will say, were about 40 per cent., which is the average of stock companies, and the expenses, 35 per cent. which is also the average. This leaves you a profit of 25 per cent., but is this a real or only a theoretical profit? You have made no provision for reinsurance reserve, that is, for cancellation. Suppose, at the end of the year, every policy was presented to you for cancellation? The average return premiums on these would equal 50 per cent. of the premiums deposited, because some would be a year old and some only a month old. This would make a total cost to you of 125 per cent. of the premiums written and, instead of a profit which you imagined would be 25 per cent., you are facing an assessment of 25 per cent. This situation is true, whether in the form of a stock company, mutual, inter-insurance or Lloyds.

"The attorney-general has ruled that inter-insurance, and the conducting of an organization for the purpose of guaranteeing each other against loss, is conducting the business of insurance, and therefore, in the absence of specific legislation to the contrary, is in violation of the present statutes. There have been two bills introduced at Trenton, during the last week, legalizing inter-insurance.

"In order to be of sufficient stability to warrant consideration of business men, inter-insurance concerns should comply with certain standards, whether compelled to do so by law or not. The oldest inter-insurance exchange was established in 1881, and has been successful. In 1910 there were 31 fire insurance exchanges in operation, and in 1912 there were 74. In 1917 there were 99, of which 27 were writing insurance on automobiles. It is noticeable that 17 of these 29 automobile reciprocals are domiciled in Illinois, where the legal requirements for the formation of such concerns are dangerously lax. There are four in California, three in Michigan, two in Pennsylvania, and one in Texas. Out of this group 24 of them have been in business less than three years, and are, therefore, still in the experimental stage."

After describing the recommendations of the Insurance Commissioners for regulating inter-insurance, the speaker said: "The expense of management should be limited to not exceeding 25 per cent. of the net premiums written, and a uniform

basis of accounting should be established, and frequent reports given to the members. It is also necessary that all members admitted in concerns of this kind should be upon the same basis of insurance, and no modification in the liability of one member over another should be permitted; all members should participate equally in the premiums and also be liable in the same ratio for assessments, should there be any.

"If your association is determined to experiment with lower cost insurance, I would strongly urge that this club, as such, form its own reciprocal or inter-insurance organization, and have a full representative upon the Advisory Board and the Board of Directors, giving the power of attorney to those in whom you have confidence. You all know, of course, that liability and fire rates have been considerably reduced within the last two or three weeks, so that future comparison between stock company costs and mutual or inter-insurance costs will show to the disadvantage of the latter." At the conclusion the subject was generally discussed, the speaker answering questions.

Vote Money for Aerial Site

The club voted \$100 towards the fund being raised in Newark to establish a site for mail airplanes. It is said that Newark has an ideal place and that the sum required, \$25,000, will be quickly subscribed.

The next meeting of the club will be held at Jersey City, Tuesday evening, April 15. This is in keeping with the policy of the organization to hold its monthly meetings in the various cities to stimulate interest in promoting the welfare of users of commercial vehicles.

Texas Taxes Trucks

AUSTIN, TEXAS, March 24.—A law recently passed by the Texas state legislature provides for a tax on trucks not to exceed $\frac{1}{2}$ cent a mile, based on gross receipts, mileage and tonnage of the truck, to be levied and collected by the commissioner's court of the county in which the truck operates. The tax applies to any person, firm or corporation, operating a truck on the public highways, for public or private use, to transport freight. Revenues derived from this source will go to the road and bridge fund of the county in which collected.

Another law passed by the legislature provides that petroleum products shall meet the standard set by the state chemist. Technical standards for every kind of oil have been set, and the pure drug department of the state is charged with the enforcement of the law. Containers of fuel oils must also be marked with the name of the manufacturer and his address.

A tax of $1\frac{1}{2}$ per cent. on all crude petroleum is provided for in another law, and it is thought that this may cause a permanent advance in the price of petroleum products.

Personal Items

Walter E. Anderson is now associated with the Curtis Tire & Rubber Co., Muskegon, Mich., in the capacity of sales manager. He was formerly associated with the Miller Rubber Co., and also with the Quaker City Rubber Co.

Fred W. Ansteth has been appointed district sales manager for the Atterbury Motor Car Co. His territory will include North and South Carolina, Tennessee, Georgia, Alabama, Mississippi and Louisiana.

Stephen M. Avery, until recently a member of the 13th Pursuit Squadron, American Air Service, has become advertising manager of the Traffic Motor Truck Corp., St. Louis, Mo.

Edward S. Babcox has been appointed sales manager of the Rubber Products Co., Barberton, Ohio, manufacturer of Stronghold tires and tubes. Mr. Babcox has, for the past six years, been advertising manager of the Firestone Tire & Rubber Co.

H. P. Baer has been appointed zone representative by the Duplex Truck Co., Lansing, Mich. He was formerly connected with the Vim Motor Truck Co.

Colonel Merrill Baker, formerly sales manager of the American Vanadium Co., of Pittsburgh, has been elected president of the American International Steel Corp., 120 Broadway, New York City.

P. E. Barker has joined the Van Dorn Iron Works Co., Cleveland, Ohio, which manufactures a line of dump bodies, hoists, winches and truck and tractor frames. Mr. Barker was formerly experimental engineer of the Northway Motor Mfg. Co., and more recently research engineer of the Aluminum Casting Co. In his connection with the Van Dorn Iron Works Co. he will have charge of the motor equipment department.

E. C. Boykin has been appointed southern district sales manager of the United States Motor Truck Co. He will make his headquarters in Nashville, Tenn., and will cover western Tennessee, Georgia, Florida and North and South Carolina.

L. W. Brownrigg has been appointed zone representative by the Duplex Truck Co., Lansing, Mich. He has been connected with the War Department for some time past, and prior to that was associated with the National Carbon Co.

C. H. Breaker has been appointed assistant sales manager of the Diamond Chain & Mfg. Co., Indianapolis, Ind.

C. J. Buckwalter has been elected president of the American Bureau of Engineering.

John B. Canfield has been appointed special representative and counsel of the Harley Co., Springfield, Mass., manufacturer of castings. Mr. Canfield has recently been discharged from the Army, in which he served as a Major of Engineers.

F. E. Carver has been appointed southern district sales manager of the Sanford Motor Truck Co. He will make his headquarters at Birmingham, Ala.

Wm. E. Cobb, formerly manager of the Chicago truck branch of the Maxwell Motor Truck Co., has been appointed district sales manager for the Four Wheel Drive Auto Co., Clintonville, Wis. His territory will include Ohio and Pennsylvania.

Frank Dawson has been made general manager of the Gary Motor Truck Co., Gary, Ind. He was formerly associated in a similar capacity with the Master Motor Truck Co., Chicago.

A. L. Dean has been appointed Pacific Coast manager by General Motors Acceptance Corp. Mr. Dean was formerly Pacific Coast manager for the Continental Guaranty Corp.

Don M. Dickinson will represent the Parker Motor Truck Co., Milwaukee, Wis., in the southeastern section of the country. Mr. Dickinson was formerly connected with the Packard-Rochester Co.

W. H. Diefendorf has resigned as chief engineer and director of the New Process Gear Corp., and is now associated with the Weekes-Hoffman Co., Syracuse, N. Y.

J. E. Duffield has been elected vice-president in charge of the sales division of the Essenkay Products Co., Chicago, Ill. Mr. Duffield was formerly general manager and treasurer of the Bailey Non-Stall Differential Co.

Frank G. Eastman recently tendered his resignation as advertising manager of the Packard Motor Car Co., Detroit, and is now associated with the Lincoln Motor Co., of Detroit.

Walter B. Elcock has recently been relieved of his duties as Major of Infantry, and has returned to the Portland Cement Association, as district engineer of the Atlanta office.

Lawrence W. Enos has been made manufacturers' representative in the Detroit district for the Firestone Steel Products Co. He was, until March 1, a lieutenant in the Quartermasters' Corps.

Conroy Fiero, formerly representative at Washington, D. C., for the Buda Co., Harvey, Ill., is now on a visit to England, France, Belgium, Italy, and possibly Russia, for the purpose of investigating conditions for marketing Buda engines.

Frank M. Foster, distributor of Commerce trucks in Detroit, has entered into a partnership with L. E. Roskan, of New York, to distribute Commerce trucks in that city. He will continue his Commerce agency in Detroit.

J. J. Frank has been appointed district manager of sales in the New York territory by L. V. Flechter & Co., Long Island City, N. Y.

H. A. Goddard, formerly representative in Michigan for the Standard Parts Co., is now in charge of sales and advertising for the Militor Motors Corp., Jersey City, N. J.

H. M. Green has been appointed Pennsylvania representative of the Precision & Thread Grinder Mfg. Co., Philadelphia, Pa.

Claude Greenhoe has been appointed chief engineer of the Motor Bearings Division of the Hyatt Roller Bearing Co., Detroit, Mich. Mr. Greenhoe fills the place formerly held by R. G. Wells, who has been promoted to chief engineer of the Hyatt factories at Newark, N. J.

F. C. Holmgren has been appointed manager of the Philadelphia branch of the Trailmobile Co. Mr. Holmgren has recently returned from France, where he served as lieutenant in the Ordnance Department. He was formerly connected with General Motors Co.

F. M. House has been made Pacific Coast manager of the Republic Motor Truck Co., Alma, Mich., with headquarters at Portland, Ore.

A. C. Keidel has been appointed district sales manager for the Denby Motor Truck Co. in southern New Jersey, eastern Pennsylvania, Delaware, Maryland, the District of Columbia and Virginia. Mr. Keidel has, for the past eighteen months, served as first lieutenant in the Department of Purchase, Motors Division.

George M. Kraus has resigned the position of Buffalo branch manager of the Polack Tyre & Rubber Co., New York.



Major Harry Unwin
Who has been appointed manager of the Chicago branch of the Reo Motor Car Company, Lansing, Michigan.



Leslie F. Smith
Who has recently been appointed general sales manager of the American Motors Corporation, New York City.



H. G. Diefendorf
Who has recently been elected vice president and general manager of the Recording Devices Company, Dayton, Ohio.



Birkett L. Williams
Who has become sales manager of the truck department of the Grant Motor Car Corporation, Cleveland, Ohio.

**E. H. Ruck**

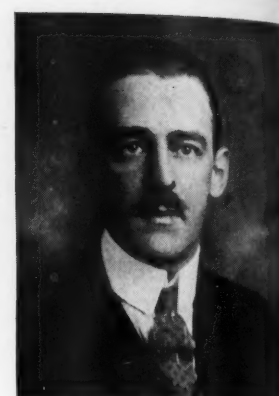
Formerly chief engineer of the Cleveland Tractor Company, who has been made chief engineer of the Automotive Corporation, Fort Wayne, Indiana.

**E. B. Mull**

President of the Mull Wood Work Company, Sidney, Ohio, manufacturer of steering wheels, etc., which has recently taken over the Tucker Wood Work Company.

**Frank H. Dewey**

Has been appointed sales engineer of Horizontal Hydraulic Hoist Company, of Milwaukee, Wisconsin. He will have charge of the general sales office at 456 Book Building, Detroit.

**Louis S. Hallowell**

Who has been made district sales manager of the Atterbury Motor Car Company, and will cover the states of Michigan, Ohio, Indiana, Illinois and Wisconsin.

Herbert N. Leonard has been made president and general manager of the Chicago Oneida Truck Co., distributor of Oneida trucks, which has recently opened sales-rooms at 1702 Michigan Ave.

Captain Stanley D. Livingston, recently discharged from the Army, has been made designing engineer of the Connecticut Telephone & Electric Co., Meriden, Conn.

Allan H. MacCaffray, former publicity manager of the S. K. F. Ball Bearing Co., Hartford, Conn., has become general sales manager of Hollister, White & Co., Inc., investment bankers, Boston, Mass.

L. M. Meers has been appointed general sales manager of the Panhard Motors Co., Grand Haven, Mich. He will have charge of export affairs, as well as the company's American sales.

E. F. Miltenberger has resigned the presidency and active management of the Manhattan Motors Corp., New York City, an affiliation of Gaston, Williams & Wigmore, Inc. This company handles the Selden truck.

John O. Munn, formerly assistant advertising manager of the Willys-Overland Co., is now advertising manager and assistant sales manager of the Republic Motor Truck Co., Alma, Mich.

H. B. Niblette has been appointed supervisor of the tire sales division of the Thermoid Rubber Co., Trenton, N. J. He was formerly connected with the B. F. Goodrich Rubber Co. and later with the Quaker City Rubber Co.

**Joseph B. Linerd**

Recently re-elected president of the Globe Rubber Tire Manufacturing Company, New York City. Mr. Linerd was formerly connected with the Goodyear Tire & Rubber Company, and later with the Ajax Rubber Company.

H. B. Parmlee has been made service engineer by the Atterbury Motor Car Co., Buffalo, N. Y. **Chas. Wiedrich** succeeds Mr. Parmlee as service manager at the Atterbury factory.

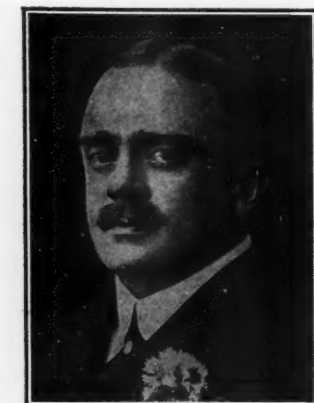
M. E. Springer has been made district manager of the United States Motor Truck Co., with headquarters at Kansas City, from which point he will cover the states of Kansas, Missouri, Oklahoma and Nebraska.

Earle T. Sutton has been transferred from the district managership at Detroit, and is now district manager in Ohio, Pennsylvania, Virginia and West Virginia territory for the Denby Motor Truck Co. He will make his headquarters at Columbus, Ohio.

S. R. Swiss has been placed in charge of the advertising department of the Republic Motor Truck Co., Inc., Alma, Mich. Mr. Swiss has been for a number of years identified with motor truck advertising. **Blaine McGrath**, formerly in charge of the advertising department of the company, has joined the sales department.

Charles G. Tobin, who until a short time ago was head of the Tobin Truck & Tractor Co., Davenport, Ia., distributor of Stewart trucks and Allis-Chalmers tractors, is now Detroit and Cleveland branch manager of the Motor List Co., with headquarters at 161 Griswold St., Detroit.

Chas. W. Unbehaun has been appointed branch manager of the Black & Decker Mfg. Co., Baltimore, Md. He will cover eastern New York and the state of Connecticut.

**T. C. Perkins**

Who has been made treasurer of the Herschell-Spillman Company, North Tonawanda, N. Y.

**J. A. Barnett**

Who has been made assistant branch manager at New York for Bearings Service Company.

**V. C. Fuller**

Traveling representative of the Bearings Service Company, who has recently been transferred to the Chicago branch.

**E. B. Ross**

Vice president of the Clark Equipment Company, of Buchanan, Michigan, who has been elected mayor of Buchanan.

In the March issue of the COMMERCIAL CAR JOURNAL, page 24, captions of T. C. Perkins and J. A. Barnett, shown below, were inadvertently transposed.

Factory News and Capital Interests

Service Motor Truck Co., Wabash, Ind., has let the contract for the erection of a new administration building, which will house the executive offices of the company, and will contain an auditorium and rooms for the use of the employees. The building will be 130 by 50 ft., and will cost approximately \$100,000. The company expects to occupy the new offices in August.

Northway Motors Corp., Natick Mass., has opened its new plant and is now in production. The company plans to make farm and road tractors and a line of passenger cars later in the year, but the production will be confined to trucks for the present. Officers of the corporation are: James F. Cavanaugh, president; James Finneran, secretary-treasurer.

Henry Ford & Son, Dearborn, Mich., has closed a contract for the erection of a two-story building to cost approximately \$200,000, to be used for the manufacture of Fordson tractors. It is expected that the building will be completed about June 1.

Wood Hydraulic Hoist & Body Co., Detroit, Mich., announces that it has completed an addition to its New York branch, which will give the company an additional 5000 sq. ft. of floor space. 7500 sq. ft. of yard room has also been acquired.

C. B. Wilson Foundry & Machine Co., Pontiac, Mich., is erecting a new unit, 100 by 800 ft. It is expected that the building will be completed within 90 days.

Arrow Grip Mfg. Co., Glens Falls, N. Y., announces that the capital stock of the company has been increased from \$100,000 to \$500,000, and is planning a new factory for the manufacture of its products, Arrow Grip Non-Skid Chains, Arrow Grip Roller Base Jack, and other accessories. This company has opened an office in the Locomobile Bldg., 16 W. 61st St., New York City, for the handling of export business.

Multiple Storage Battery Co., New York City, announces that its new factory at Jamaica, Long Island, is nearing completion. The company expects to occupy the new building about May 1. N. D. Sturgis is president of the company, and Joseph Bayne, vice-president.

Liberty Starters Corp., Poughkeepsie, N. Y., is building a one-story plant, 60 by 200 ft. The cost will be about \$50,000.

Corbitt Motor Truck Co., Anderson, N. C., is erecting an addition to its plant No. 3, and will, upon its completion, be able to increase production accordingly.

Rotary Tire & Rubber Co. announces the completion of its new plant at Zanesville, Ohio. The company plans to manufacture 100 casings and 100 inner tubes a day.

National Auto Wheels Corp., Wausau, Wis., maker of resilient artillery wheels for use with solid tires, is planning to enlarge its plant facilities and will manufacture in its own plant, virtually every part entering into the construction of the wheel. John R. Metzner is general manager of the company, which is capitalized at \$150,000.

New Agencies

Charles F. Stork & Co., Tribune Bldg., New York City, has taken over the export sales of the United States Motor Truck Co., of Covington, Ky.

Charles M. Nauts has closed a contract with the Lewis-Hall Iron Works for the distribution of Hall trucks in the Ohio territory. Sales and service stations will be established both at Columbus and Toledo.

Paige Co. of Arkansas, Little Rock, Ark., has been made state distributor of Paige trucks.

Capitol City Auto Co., Hartford, Conn., will handle the White truck in that territory.

R. B. Morse Auto Co., Weiser, Idaho, has been appointed dealer in that territory by the Acason Motor Truck Co.

Tower Motor Truck Co. of Illinois, Inc., with headquarters at Chicago, will distribute Tower trucks in the state of Illinois, southern Wisconsin, eastern Iowa, northern Indiana and southwestern Michigan. W. J. Mead, formerly general manager of the Olds Motor Works, heads this organization.

United States Truck Sales Co., of Indiana, was recently organized, and is now distributing United States trucks in Indianapolis and southern Indiana.

Lorenz Bros., Des Moines, Ia., will distribute the Menominee trucks in the state of Iowa.

Duplex Truck Co., Lansing, Mich., announces the appointment of the following distributors: T. G. Young, 1000 Pike St., Seattle, Wash.; Barber-Potter Motor Co., Albuquerque, N. M.; Lester Auto Co., El Paso, Texas; W. C. Thomas, 921 Main St., Jacksonville, Fla.; Wilson-Barber Auto Co., Sioux Falls, S. D.

Cole & Dixon, Inc., has been appointed distributor in the metropolitan territory by the United States Motor Truck Co. The Cole & Dixon Co. has salesrooms and service stations in New York City; Newark, N. J.; Jersey City, and Albany.

Master Motor Truck Corp., New York City, with salesrooms at 1777 Broadway, has taken the distribution of Master trucks. Master trucks were formerly handled in New York by the Cutting-Larsen Co.

United States Truck Sales Corp., of New York, which is operated under the direction of C. W. Moody, is now directing United States Motor Truck sales in eastern territory. Headquarters are at 1457 Broadway, New York City.

Sanford Motor Truck Co., Syracuse, N. Y., has recently appointed the following sub-dealers: Hartig, Fickling & Kleim, Inc., Baltimore, Md.; Max Shapiro, Perth Amboy, N. J.; E. K. Mitchell, Dunkirk, Ohio; Mutual Iron Works, Jersey City, N. J.; A. J. Whissel Co., Inc., Buffalo, N. Y.; Monn Bros., Harrisburg, Pa.; M. P. Wight, Augusta, Me.; Edwards Auto Co., Watertown, N. Y.

Oridge-Weathers Co., Greensboro, N. C., has recently been formed to handle the distribution of Oakland cars and G. M. C. trucks.

Warrington Auto Construction Co., 82 Allen Ave., Pittsburgh, Pa., has recently closed a contract with O. Armleder Co., for distribution of Armleder trucks in that territory.

Removals and Trade Changes

Elyea Co., Atlanta, Ga., has succeeded the Elyea-Austell Co. This company is a wholesale distributor of automotive equipment. E. L. Elyea continues as the active head of the company. E. F. Yancey is in charge of the automotive equipment department.

Indiana Lamp Co., Connersville, Ind., announces that it is now located in a new plant at 20th St. & Milton Pike. At a recent meeting the stock of the company was increased to \$500,000. Several changes in the organization of the company was made. W. F. Thomas was appointed sales manager and L. E. Glass, purchasing agent.

Harrison Radiator Corp., Detroit, Mich., announces that the headquarters of its sales service and inspection departments are now located in new offices at 3066 W. Grand Boulevard. Louis J. Schneider, sales manager of the company, is in charge.

Mansfield Steel Corp., Detroit, Mich., has taken over the J. E. Bolles Iron & Wire Works. This company will make pressed steel bodies and motor truck frames, tractor wheels and structural and channel tractor frames. The plant is being equipped with 12 bending rolls, Thompson electric built welding and riveting machines, heavy press bull dozers and other up-to-date equipment for handling this type of work.

Walker-Weiss Axle Co., Flint, Mich., will be known in future as the Flint Motor Axle Co. W. T. Walker, who was vice-president and general manager of the company, is now general manager of the M. & S. Gear Co., of Detroit. C. H. Bonbright is president of the company; F. J. Weiss, vice-president and general manager, and H. E. Schweitzer, secretary.

Kalamazoo Motors Corp. has been organized with a capital of \$250,000, to take over the business of the Lane Motor Truck Co., of Kalamazoo, Mich. The company holds the patent rights on an axle that is being subjected to severe tests. This axle will be manufactured in addition to the regular truck line.

General Motors Corp., Pontiac, Mich., has bought the plant of the Interstate Automobile Co., Muncie, Ind. Forty acres of land adjoining the plant have also been purchased and additional buildings will be erected on this site.

Baker & Lockwood Mfg. Co., Kansas City, Mo., maker of automobile tops, seat covers and jiffy curtains, announces the establishment of a manufacturing branch in the Kent Bldg., Kent Ave. & S. 11th St., Brooklyn, N. Y., to handle its eastern and export trade.

Hammered Piston Ring Co. of America, Newark, N. J., announces that the headquarters of the company is now at 704 S. 11th St., Newark.

Duplex Engine Governor Co., Inc., Brooklyn, N. Y., announces that its Chicago office has been removed from 220 South State St. to 28 East Jackson Blvd. J. E. Simonds continues as district manager.

Multiple Storage Battery Co., New York City, announces the removal of its offices from 427 W. 50th St. to 104 W. 52nd St.

American Ball Bearing Co. announces that its Cleveland offices have been removed from the Hickox Bldg. to larger quarters at 515 Standard Parts Bldg.

McGraw Tire & Rubber Co. announces that the executive and general offices of the company have been transferred from East Palestine, Ohio, to Cleveland. The new offices are located at 1900 Euclid Ave. A sales office has also been established at 1904 Euclid Ave. to serve local passenger car and truck tire customers. The company expects to increase its production to 10,000 tires and tubes per day. Production plans of the company indicate expansion from five to ten thousand tires and tubes per day.

Tucker Wood Work Co., Sidney, Ohio, manufacturer of steering wheels, etc., has been purchased by the Mull Wood Work Co. The new owners will manufacture steering wheels, bicycle rims and other bent wood specialties. E. B. Mull, president of the company, was for a number of years assistant director of service of the Willys-Overland Co.

Horizontal Hydraulic Hoist Co., Milwaukee, Wis., announces that it has removed its general sales office to the Book Bldg., Detroit. Manufacturers, dealers and users of motor trucks are invited to submit their material-handling problems to Frank H. Dewey, sales engineer of the company, who will give assistance in solving them, regardless of the placing of orders. The district office in the People's Gas Bldg., Chicago, and the factory in Milwaukee will be continued.

KEY OF ABBREVIATIONS

Used in the Specifications of Commercial Cars Listed on the Pages Following

Own—Own Make
Opt—Optional

Engine: Cont—Continental

Her—Hercules
H-Sp—Herschell-Spillman
Lite—Light Mfg. & Foundry Co.
Lyc—Lycoming
Ster—Sterling
Wau—Waukesha
Wis—Wisconsin

Valve Location: L—ELL-Head

T—TEE-Head
O—Overhead

How Cooled: C—Centrifugal Pump

G—Gear Pump
P—Water Pump
T—Thermo-Syphon
W—Water

Radiator (Make or Type): Bus—Bush

Can—Candler
EM—English-Mersick
Eur—Eureka
Fed—Fedders
Flex—Flexo
GO—G. & O.
Har—Harrison
Hovn—Hooven
Idl—Ideal
JMS—Jamestown
Lng—Long
McC—McCord
May—Mayo
MR—Marlin-Rockwell
Per—Perfex
R-T—Rome-Turney
Stan—Standard

C—Cellular
T—Tubular
H—Honeycomb

Tires: (Solid unless otherwise stated).

*—Pneumatic
D—Dual
S—Steel
T—Triple

Lubrication: C—Centrifugal Pump
Fo—Force-Feed
FG—Force and Gravity
FS—Force and Splash
SP—Splash Feed
P—Water Pump

Carburetor: B&B—Ball & Ball

Cart—Carter
Ens—Ensign
Flech—Flechter
Holl—Holley
John—Johnson
Mar—Marvel
Mas—Master
Mill—Miller
Strm—Stromberg
Shk—Shakespeare
Sheb—Schebler
Spec—Special
Till—Tillotson
Zen—Zenith

Ignition System: (Make or Type)

At-Kt—Atwater Kent
Au-L—Auto-Life
Bat—Battery
Bosh—Bosch
Berl—Berling
Conn—Connecticut
Delc—Delco
Dix—Dixie
Eism—Eisemann
King—Kingston
Mag—Magneto
NE—North East
POL—Prest-O-Lite
Sim—Simms
Spld—Spiltdorf

Engine Starter: Au-L—Auto Lite

Bosh—Bosch
Bij—Bijur
Dyn—Dyneto
G&D—Gray & Davis
L-N—Leece-Neville
West—Westinghouse

Clutch: B—Borg & Beck

C—Cone
D—Disc
F—Fuller
G—Detroit Gear & Machine
H—Hartford
L—Brown-Lipe
M—Merchant & Evans (Hele-Shaw)
U—Muncie
W—Warner
O—Own

Transmission: B-Lipe—Brown-Lipe

Cott—Cotta
Covt—Covert
Det—Detroit
Durst—Durst
Full—Fuller
G-Lee—Grant-Lees
I-CI—Individual Clutch
MM—Mechanics Machine Co.
Munc—Muncie
Plan—Planetary
Prog—Progressive
Rock—Rockford
Selec—Selective
Warn—Warner

Drive: B—Bevel Gear

C—Chain
Ct—Concentric Spur
F—Friction
I—Internal Gear
O—Own
R—Roller
S—Shaft
SB—Spiral Bevel
Sp—Spur
W—Worm

Universal: Arv—Arvac
Bld—Blood Brothers
Hart—Hartford
K-B—Kinsler-Bennett
M—Merchant & Evans
Spic—Spicer
Ther—Thermoid
UM—Universal Machine Co.
UP—Universal Products Co.

Rear Axle: Cel—Celfor

Cl—Clark
Emp—Empire
Rock—Rockford
Russ—Russel
Sals—Salisbury
Shel—Sheldon
Timk—Timken
Torb—Torbensen
W-M—Weston-Mott

Flot—Full Floating
1/4-Ft—Semi-Floating
3/4-Ft—3/4 Floating
1/2-Ft—1/2 Floating

Spring Suspension:

CC—Cleveland-Canton
Det—Detroit
IC—Iron City
Kal—Kalamazoo
Mar—Maremont
Math—Mather
Nat—National
Row—Rowland
Per—Perfection
Shel—Sheldon
SP—Spring Perch
Stan—Standard
Ster—Sterling
Tut—Tuthill
US—United States

Steering Gear:

CAS—C. A. S. Products Co.
Dit—Ditwiler
Gem—Gemmer
Jac—Jacox
Lav—Lavine
W—Worm
Warn—Warner
Wohl—Wohlrab

Governor: C—Centrifugal

Cont—Continental
Del—Delaney
Dup—Duplex
McC—McCanna
Mer—Merrill
Mon—Monarch
Pier—Pierce
Rug—Ruggles
Simp—Simples
Wau—Waukesha

EXTRA ABBREVIATIONS USED ON ELECTRICS

Battery: Exid—Exide

Edis—Edison
Phil—Philadelphia

Motor: Gn-El—General Electric Co.

West—Westinghouse
Control: Gn-El—General Electric Co.
West—Westinghouse

Commercial Car Specifications—Corrected Monthly

The Specifications, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. Gasoline Tractor-Trucks and Electric Commercial Cars Will be Found at the End of Gasoline Commercial Cars

Model a. c.	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pt. Cent of Weight on Rear Wheels
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800 Pounds																												
Minnesota Overland	800 1777	320 900	Own Own	4 4	2 3/4 x 4 3 3/8 x 5	12.8 18.2	3 4	3/4 3/4	L L	T T	H C	FS FS	Strm Till	At-K Conn	Au-L	C	Fric Selec	3 3	Dead Own	O'n Ch B	1/2 Fl 3/4 Fl	92 104	Tut S&C	28x3 31x4	28x3 31x4	Own Own	60 63.8
1000 Pounds																												
Briscoe 4-24	825	825	Own	4	3 1/2 x 5 1/2	16.9	3	3/4	L	T	C	FS	Buick	Bat	Au-L	C	Own	3	Own	B	1/2 Fl	103	Har	31x4	31x4	Own	.....	80
Corliss 1919	1150	715	LRol	4	3 1/2 x 4 1/2	16.9	4	3/4	L	T	C	FS	Stew	Dix	NE	C	Own	3	Arv	BG	1/2 Fl	103	Har	31x4	31x4	Wohl	.....	41
Dodge	1875	935	Own	4	3 1/2 x 5 1/2	24	3	3/4	L	T	C	FS	Stew	Dix	NE	C	Own	3	Arv	BG	1/2 Fl	103	Har	31x4	31x4	Wohl	.....	41
Edwards 25A	2300	...	Lyco	4	3 1/2 x 5 1/2	18	3	3/4	L	T	C	FS	Stew	Dix	NE	C	Own	3	Arv	BG	1/2 Fl	103	Har	31x4	31x4	Wohl	.....	41
Moore C	1800	...	GBS	4	3 1/2 x 4 1/4	22.5	3	3/4	L	T	C	FS	Stew	Dix	NE	C	Own	3	Arv	BG	1/2 Fl	103	Har	31x4	31x4	Wohl	.....	41
Rainier R-5	2250	1250	Lite	4	3 1/2 x 4 1/4	18	3	3/4	L	T	C	FS	Stew	Dix	NE	C	Own	3	Arv	BG	1/2 Fl	103	Har	31x4	31x4	Wohl	.....	41
Ville 21	2750	2000	Cont	4	3 1/2 x 5 1/4	22.5	3	3/4	L	T	C	FS	Stew	Dix	NE	C	Own	3	Arv	BG	1/2 Fl	103	Har	31x4	31x4	Wohl	.....	41
Winther 39	1950	945	Own	4	3 1/2 x 4 1/4	14.1	3	3/4	L	T	C	FS	Stew	Dix	NE	C	Own	3	Arv	BG	1/2 Fl	103	Har	31x4	31x4	Wohl	.....	41
Winther 39	2100	2100	Wis	4	3 1/2 x 5	22.5	3	3/4	L	T	C	FS	Stew	Dix	NE	C	Own	3	Arv	BG	1/2 Fl	103	Har	31x4	31x4	Wohl	.....	41
1200 Pounds																												
Overland	2179	....	Own	4	4 1/4 x 4 1/2	27.2	2	3/4	L	T	C	FS	Till	Conn	Au-L	C	Selec	3	Own	SB	3/4 Fl	106	S-El	33x4 1/2	33x4 1/2	Own	.....	68.8
1500 Pounds																												
Atlas 19	2320	1135	Lyco	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Diehl A	2400	1575	Cont	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Dispatch G	2200	1200	Wis	4	3 1/2 x 5	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Famous 10	2100	800	Lyco	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
G. M. C. 16	2760	1495	Own	4	3 1/2 x 5 1/4	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
International H	2800	1550	Own	4	3 1/2 x 5 1/4	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Old Hickory M	2100	995	Lyco	4	3 1/2 x 5 1/4	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Rainier R 2	2700	1350	Lite	4	4 1/4 x 4 1/2	22.4	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Reo F	2525	1350	Own	4	3 1/2 x 5	22.4	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Shaw M-2	1750	1050	LRol	4	3 1/2 x 4 1/2	15.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Steward 6	2575	1100	Cont	4	3 1/2 x 5 1/2	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Tiffin A	2200	1200	Own	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
White G B B E	2960	2300	Own	4	3 1/2 x 5 1/2	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
1 Ton																												
Acme B	3200	1950	Cont	4	3 1/2 x 5	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
All-American A-A	2800	1285	H-Sp	4	3 1/2 x 5	16.9	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Beck-Hawkeye A	2800	1550	Cont	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Besemer G	2900	1575	Own	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Briscoe T-34	2840	1325	Own	4	3 1/2 x 5 1/4	18.9	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Chevrolet T	2900	1750	Cont	4	3 1/2 x 5	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Columbia F	2900	1500	Cont	4	3 1/2 x 5	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Commerce E	3300	2000	Cont	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Corbitt E	3050	2100	Buda	4	3 1/2 x 5 1/4	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Day-Elder A	2100	1775	GBS	4	3 1/2 x 5 1/2	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Dearborn A	3000	1775	Cont	4	3 1/2 x 5 1/4	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Denby 12	2770	2125	Cont	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Diamond T-J 5	3050	1900	Cont	4	3 1/2 x 5	19.6	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Federal S	3900	1900	Cont	4	3 1/2 x 5 1/2	22.5	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Ford T	1450	550	Own	4	3 1/2 x 4	14.4	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75
Gabriel C	2750	1950	Buda	4	4 1/4 x 5 1/2	28.9	3	3/4	L	T	C	FS	Cart	Remy	USL	C	Selec	3	Arv	B	1/2 Fl	118	Row	32x4	32x4	CAS	.....	75

Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Plaston Rings Per Cylinder	Groove Width	Valve Location	How Cooled	Radiator	Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr. Cent of Weight on Rear Wheels
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1 Ton—Continued

Garford 75 C	3900	2500	Buda	4	3 1/2 x 5 1/2	22.5	3	1 1/2	T	T	Idl	McC	Sp	Rayf	Spid	W	W	W	3	Spic	W	W	128	Per	34x4 1/2	36x4	Ross	Simp
Gary F	3200	1850	Cont	4	3 1/2 x 5	22.5	3	1 1/2	T	T	Idl	McC	Sp	Rayf	Spid	....	W	W	W	3	Spic	W	W	130	Tut	36x3 1/2	36x4	Ross	Pier	....
G. M. C. 21	3794	2025	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Mar	Eism	....	W	W	W	3	Spic	W	W	136	Math	34x3 1/2	34x5	Jac	Mon	94
Grant 12	2300	1125	H-Sp	4	3 1/2 x 5	16.9	3	1 1/2	T	T	Idl	Fed	Sp	Cart	Eism	....	W	W	W	3	Arv	W	W	115	Del	32x4 1/2	32x4	Dit	....	65
Hahn C	3600	1375	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Cart	Eism	....	W	W	W	3	Arv	W	W	130	Del	34x3	34x4	Lav	....	65
Hahn C	4200	1950	Cont	4	4 1/2 x 5 1/4	30	4	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Spic	W	W	136	Del	36x5	36x5	Ross	Pier	66
Higraide A 18	2900	2100	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	115	Shel	34x3 1/2	34x5	Lav	Dup	80
Hoover 15-B	2425	1485	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Huffman A	3200	1495	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
International F	3000	1550	Cont	4	3 1/2 x 5 1/4	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Jones 31 A. M.	3400	1395	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Larabee-D. M.	3400	1250	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Mack	4250	2400	Own	4	3 1/2 x 5	25.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Maxwell	2385	1085	Own	4	3 1/2 x 5	25.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Memominee-HT	2940	1890	Cont	4	3 1/2 x 5 1/2	21.3	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Moreland 17 N	2750	2175	Cont	4	3 1/2 x 5	22.5	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Myers 50	2750	1495	Lycy	4	3 1/2 x 5	22.5	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Nash 2018	3400	1285	Gray	4	3 1/2 x 5 1/4	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Nels. & LeMoon F1	3400	1650	Own	4	3 1/2 x 5 1/4	22.5	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Norwalk	1650	2000	Cont	4	3 1/2 x 5	22.5	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Ogden A1	3400	2095	Cont	4	3 1/2 x 5 1/4	22.5	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Onetida A	4320	2290	Cont	4	3 1/2 x 5 1/4	22.5	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Panhard	2688	1195	Gray	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Piedmont O	2800	1550	Lycy	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Rainier R-7	2850	1535	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Republic 10	2850	1535	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Royal	3000	1795	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Sandow G	3000	1795	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Selden TWR	3000	2000	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Service 220	3470	2100	Buda	4	3 1/2 x 5 1/4	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Signal F	4265	2400	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Stewart 8	2820	1575	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Superior A	2680	1600	Gray	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Vim 25	2800	2195	Own	4	3 1/2 x 5 1/4	22.5	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Wichita L	3400	2000	Own	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70
Wilson F	3150	1750	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Idl	McC	Sp	Strm	Bosh	....	W	W	W	3	Bld	W	W	120	Shel	34x3 1/2	34x5	Lav	....	70

1 1/4 Ton

Collier 16	2600	1375	Lycy	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Jms	Stan	Sp	Zen	Conn	....	B	B	B	3	Ther	B	B	128	Ster	32x4 1/2	33x4 1/2	Dit	....	50
Comet 1 1/2	2800	1750	Lycy	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Jms	Stan	Sp	Zen	Conn	....	B	B	B	3	Ther	B	B	130	Mar	34x4	34x4	CAS	....	85
Commerce EP	3200	1895	Cont	4	3 1/2 x 5	22.5	3	1 1/2	T	T	Jms	Stan	Sp	Zen	Conn	....	B	B	B	3	Ther	B	B	144	Kal	36x6	36x6	Jac	....	80
Koehler K	3000	1450	Own	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Jms	Stan	Sp	Zen	Conn	....	B	B	B	3	Ther	B	B	129	Per	34x4	34x4	Own	Mon	70
Rahner R-4	3100	1595	Lite	4	3 1/2 x 5	16.9	3	1 1/2	T	T	Jms	Stan	Sp	Zen	Conn	....	B	B	B	3	Ther	B	B	125	Per	31x4	31x4	Lav	Mon	80
Sandow C G	3300	2090	Cont	4	3 1/2 x 5	19.6	3	1 1/2	T	T	Jms	Stan	Sp	Zen	Conn	....	B	B	B	3	Ther	B	B	134	Det	34x3 1/2	34x5	Ross	....	67

1 1/2 Ton

Wau	3650	2575	Cont	4	3 1/2 x 5 1/2	22.5	3	1 1/2	L	P	C	T	H	Sp	Sheb	Elism	....	F	Full	3	Bid	W	Timk	142	Det	36x3 1/2	Ross	Wau	73
Cont	4770	2575	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/2	L	P	C	T	H	Sp	Zen	Elism	....	F	B-Li	4	Spic	W	Timk	140	SP	36x3 1/2	Gern	Pier	96.5
Cont	3200	1950	Cont	4	3 1/2 x 5	22.5	3	1 1/2	L	P	C	T	H	Sp	Strm	Bosh	....	F	Full	3	Arv	I	1/2	Hig	34x3 1/2	Lav	Pier	75	
Cont	3500	1945	Cont	4	3 1/2 x 5	22.5	3	1 1/2	L	P	C	T	H	Sp	Zen	Bosh	....	F	B-Li	3	Arv	I	Torb	Per	36x3 1/2	Ross	....	63	
Own	3300	1965	Own	4	3 1/2 x 5 1/4	22.5	3	1 1/2	L	P	C	T	H	Sp	Sheb	Bat	G&D	B	Full	3	UP	I	Russ	144	Per	34x5	Lav	Mon	85
Cont	4000	2450	Cont	4	3 1/2 x 5 1/2	22.5	3	1 1/2	L	P	C	T	H	Sp	Sheb	Elism	....	F	B-Li	3	Spic	W	Timk	140	Mer	36x3 1/2	Gem	Opt	70
Buda	2550	2400	Buda	4	3 1/2 x 5 1/2	22.5	3	1 1/2	L	P	C	T	H	Sp	Zen	Elism	....	F	B-Li	3	Spic	W	Timk	140	Mer	36x3 1/2	Ross	Mon	70
Cont	3890	2400	Cont	4	3 1/2 x 5	22.5	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	G&D	L	Full	3	....	W	Shel	138	Shel	36x3 1/2	Ross	Pier	75
Cont	3300	2075	Cont	4	3 1/2 x 5	22.5	3	1 1/2	L	P	C	T	H	Sp	Zen	Berl	....	F	C	Covt	3	Hart	W	Stan	Tut	34x5	Ross	....	80
Cont	3280	1980	Cont	4	3 1/2 x 5	19.6	3	1 1/2	L	P	C	T	H	Sp	Strm	Bosh	....	F	C	Covt	3	Hart	W	Stan	Tut	34x4	Lav	....	72
Cont	3200	1795	Cont	4	3 1/2 x 5	22.5	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	126	Tut	34x5	Dit	Mon	85
Cont	3700	2550	Cont	4	3 1/2 x 5	22.5	3	1 1/2	L	P	C	T	H	Sp	Strm	Bosh	....	F	B-Li	3	Arv	I	Torb	135	Det	34x3 1/2	Gern	Pier	....
Cont	3600	2050	Cont	4	4 1/2 x 5 1/2	27.2	3	1 1/2	L	P	C	T	H	Sp	Strm	Bosh	....	F	B-Li	3	Arv	I	Torb	137	Math	36x3 1/2	Ross	Pier	65
Buda	3100	2000	Buda	4	3 1/2 x 5 1/2	27.2	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	138	Det	36x3 1/2	Ross	Mon	75
Cont	3600	2250	Cont	4	3 1/2 x 5 1/2	27.2	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4250	2350	Cont	4	3 1/2 x 5 1/4	18.2	3	1 1/2	L	P	C	T	H	Sp	Zen	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
H-Sp	3120	1850	H-Sp	4	3 1/2 x 5 1/4	18.2	3	1 1/2	L	P	C	T	H	Sp	Zen	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Buda	4180	3000	Buda	4	3 1/2 x 5 1/2	22.5	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T	H	Sp	Strm	Elism	....	F	B-Li	3	Arv	I	Torb	137	Det	36x3 1/2	Ross	Mon	75
Cont	4200	....	Cont	4	4 1/2 x 5 1/2	28.9	3	1 1/2	L	P	C	T</																	

Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pt. Cent of Weight on Rear Wheel
1½ Ton—Continued																												
Giant 14	3600	2250	Cont	4	3½x5	19.9	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
G. M. C. 31 A	4110	2395	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
G. M. C. 31 B	4150	2395	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gramm-B 15	3700	1895	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grant 10	3000	1885	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grant 11	3000	1885	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hahn D	4100	2225	Cont	4	4½x5½	30	4	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Harvey W E A	3850	2250	Buda	4	4½x5½	22.2	4	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hawkeye K	3400	1900	Buda	4	3½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Independent D	3400	1890	Cont	4	3½x5½	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
International K	3400	2200	Ow	4	3½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kelly-Spiff K 31	4590	2750	Ow	4	3½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kelly-Spiff K 32	4685	2750	Ow	4	3½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kimball	3500	2073	Wis	4	4½x6	24.1	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kissel	3500	2073	Ow	4	3½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lane G	3940	2250	Cont	4	3½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mack L	4050	2750	Cont	4	3½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mack AB	4800	2800	Ow	4	4½x5	25.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Manly 30	.....	.....	Wau	4	3½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Master Junior JW	3800	1990	Buda	4	4½x5½	27.2	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Master Junior JI	3800	1890	Buda	4	4½x5½	27.2	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Menominee H	2475	.....	Cont	4	4½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moreland HB	4150	2650	Cont	4	4½x5½	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Myers 70	3000	1750	Lyc	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Myers 75	2950	1700	Lyc	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Napoleon 11	3450	1485	Gray	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nels.&LeMoon F1½	3400	2425	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North	1850	1750	Lyc	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Old Reliable WA	4150	2350	Wis	4	4½x5½	27.2	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
O. K. 1½ T	3500	2450	Rut	4	4½x5½	27.2	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oneida B	3500	2650	Cont	4	4½x5½	25.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Packard 1½ E	4640	3000	Ow	4	4½x5½	25.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panhard B	2888	1395	Gray	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Patriot Lincoln	3400	2150	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Piedmont	.....	.....	Lyc	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rainier R-6	3400	1880	Cont	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Republic 11X	3200	1885	Cont	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Royal	2800	1885	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sandow 1-1½	3700	2375	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Schwartz	3500	2175	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Signal H	4675	2700	Cont	4	4½x5½	27.2	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stewart 9	3440	1975	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sullivan F	3500	2350	Buda	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas TK	3200	1500	Lyc	4	3½x5	19.6	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiffin GW	3750	2125	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Transport 30	3250	2185	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Triangle A	3750	2185	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
United AX	.....	.....	Wau	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
White Hickory H	3975	2400	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wichita L	3600	2350	Ow	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wolverine C	3400	2250	Cont	4	3½x5	22.5	3	1	L	T	C	T	Sp	Rayf	Spid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2 Ton																												
Acme A	4450	2750	Cont	4																								

[illegible]

2 Ton—Continued

[illegible]

Model	Chassis Weight		Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	P. Cent of Wheel on Rear Wheel		
	White	Black																													
Wichita M	4700	4700	2750	Wau	4	3 1/2 x 5 1/4	22.2	3	1 1/4	1 H T T	Q-T-D	Q-T-L	Per	FS	Strm	Bosh	...	...	Cont	3	Own	W	Shel	144	Det	36x4	36x7	Ross	Wau	80
Wilson E	4500	4500	2800	Cont	4	4 1/2 x 5 1/4	27.6	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Mar	Elsm	Bij	Covt	3	K-B	I	Cl	144	Tut	36x4	36x7	Ross	Pier	80
Winther 49	5300	5300	3000	Wis	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	Full	3	Arv	I	Cl	150	Math	36x4	36x7	Ross	Dup	80
Winther 439	5300	5300	2100	Gray	4	3 1/2 x 5	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	Full	3	Arv	I	Cl	132	Har	36x4	36x7	Ross	Pier	67
Witt Will	4550	4550	2850	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Zen	Elsm	...	...	Covt	3	Spic	W	Timk	144	S-El	36x3 1/2	36x7	...	...	...

2 Ton—Continued

2 Ton—Continued

Bessemer J-2	4500	2775	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-D	Q-T-L	Per	FS	Rayf	Bosh	...	...	...	B-Li	4	Arv	UP	Torb	158	Per	36x4	36x4D	Ross	Pier	67
Bethlehem J-E	3950	2365	Own	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Shelb	Will	G&D	...	...	Det	4	UP	W	Russ	144	Shel	36x4	36x4	Ross	Mon	85
Brinton B	4600	3000	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Bosh	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Concord B	4600	3000	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Corbitt B	4600	3000	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Day-Elmer C	4600	2750	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
DeKalb E 2 1/2	4600	2600	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Doane 1919	4750	3150	Wau	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Gary HU	5200	3150	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Gersix G	5200	3150	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Gramm-Bernst.	5200	3150	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Harvey WFA	5200	3150	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Huffman B	5200	3150	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Jumbo D	4800	1695	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Kankakee E	3500	2255	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Kelly-Spfd K35	3500	2255	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Kelly-Spfd K36	3500	2255	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Koehler L	3500	2255	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Larrabee-Deyo	5000	3000	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Maccar H	5000	3000	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Manly	5200	3150	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Moreland	5200	3150	Buda	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Netco H	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Noble NW2	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Old Reliable	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Panhard E	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Patriot	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Rauston	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Rock Falls	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Rowe CDW	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Royal	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Sandow J	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Sanford 25	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Schacht	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Schwarz	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Sterling	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Tiffin MW	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Transport 50	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Triangle B	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Union B	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
United BX	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
U. S. H.	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
White TJ	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70
Winther 69	4500	2100	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-L	Q-T-L	Per	FS	Strm	Elsm	...	...	...	Det	4	Spic	W	Timk	140	Shel	36x4	36x4	Ross	Mon	70

3 Ton

3 Ton

Denby 25	4500	3000	Cont	4	4 1/2 x 5 1/4	27.2	3	1 1/4	1 H T T	Q-T-D	Q-T-L	Per	FS	Strm	Elsm	Full	4	UP	R	Russ	150	Det	36x4	3
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Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Plaston Rings Per Cylinder	Plaston Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr. Cent of Weight on Rear Wheels
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3 1/2 Ton—Continued

Atterbury 7D	6910	3875	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Zen	Elism	B	B-Li	4	Spic	W	Timk	167	SP	36x5	40x5D	Gem	Pier	9	
Available 3	6400	...	Cont	4	4 1/2 x 5 1/2	32.8	3	1 1/4	1	0	T	FS	Strm	Bosh	....	B	B-Li	4	Spic	W	Timk	168	Tut	36x5	36x5D	Lav	Pier	75
Bessemer K	5900	3450	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Rayf	Bosh	....	B	B-Li	4	Spic	I	Torb	175	Per	36x6	36x5D	Ross	Pier	85
Bethlehem F	4983	3465	Own	4	4 1/2 x 6	30.6	3	1 1/4	1	0	Fed	FS	Sheb	Will	G&D	B	Def	3	UP	I	Russ	162	Shel	34x4	34x5D	Lav	Mon	80	
Brockway R	6800	3750	Cont	4	4 1/2 x 5 1/2	32.4	4	1 1/4	1	0	Bus	FS	Sheb	Elism	....	L	B-Li	4	Spic	W	Timk	170	Opt	36x5	36x5D	Gem	Opt	70
Clydesdale 90	6600	...	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Zen	Bosh	....	L	B-Li	4	Spic	W	Timk	170	Stan	36x5	40x5D	Ross	Own	78
Corbitt A	6780	4000	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	G&D	M	Cott	3	....	W	Shel	168	Shel	36x5	36x10	Ross	Pier	80
Couple Gear	9000	6000	Buda	4	5 1/2 x 5 1/2	35	4	1 1/2	1	0	C	H	Strm	Elism	....	W	Own	144	Tut	B	Own	144	Tut	36x4D	36x10	Own	....	55
Day-L Elder F	6740	4000	Wis	4	4 1/2 x 6	32.5	3	1 1/4	1	0	Bus	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	160	Per	36x5	36x10	Ross	Simp	73
Defiance D	5600	3350	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	P	FS	Zen	Berl	....	B	B-Li	4	Hart	W	Wis	165	Shel	36x5	36x5D	Ross	Mon	85
Denby 27	6890	4150	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	Per	FS	Strm	Elism	L	B	Warn	3	Arv	I	Torb	164	Det	36x5	36x5D	Ross	Simp	79
Diamond T-LB	6570	4150	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	C	T	Strm	Bosh	....	L	B-Li	4	UP	W	Cl	170	Math	36x5	36x5D	Gem	Pier	60
Duplex E	6050	4000	Buda	4	4 1/2 x 5 1/2	36.1	3	1 1/4	1	0	Flex	FS	Sheb	Dix	....	L	B-Li	4	Bld	W	Timk	180	Tut	36x5	36x5D	Ross	Dup	80
Federal W	7300	4250	Wau	4	4 1/2 x 5 1/2	36.1	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Garford 77C	7000	3350	Wis	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Zen	Berl	....	B	B-Li	4	Arv	W	Timk	165	Shel	36x5	36x5D	Ross	Simp	72
Gary K	7235	4300	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	Bus	FS	Strm	Elism	....	W	Warn	4	Hart	W	Wis	165	Shel	36x5	36x5D	Ross	Mon	85
Giant 17	6800	3850	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	B	B-Li	4	UP	I	Torb	164	Det	36x5	36x5D	Ross	Simp	79
G. M. C. 71A	6985	3750	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	L	B-Li	4	Spic	W	Timk	170	Math	36x5	36x5D	Gem	Pier	60
G. M. C. 71B	7100	3800	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	L	B-Li	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Dup	80
Gramm-Berns.	6790	4000	Wau	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Bld	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Hahn F	7000	3250	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	72
Hall	6100	3500	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Arv	W	Timk	165	Shel	36x5	36x5D	Ross	Mon	85
Harvey WHA	7700	3900	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	B	B-Li	4	UP	W	Cl	170	Det	36x5	36x5D	Ross	Simp	79
Hendrickson J	7700	3900	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Hurlbut	6400	4250	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Bld	W	Timk	180	Math	36x5	36x5D	Ross	Dup	80
Kelly-Sp'd. K-40	8285	4250	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Kissel	8000	4785	Own	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Koehler M	4300	2965	....	6	3 1/2 x 5 1/2	25.6	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Lane K	5870	3900	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Larrabee-Deyo	6000	3950	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Macarac M	6850	3500	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Master A	8070	4600	Own	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Menominee G	6000	3850	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Neils & LeMoon F3 1/2	6000	3750	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Old Reliable	6850	4000	Wis	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Oneda	7270	3700	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Palmer 61-18	7300	3950	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Republic 20	6800	3450	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Ralston	6300	3850	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Rover DEW	6520	3800	Wis	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Sandow K	6900	3975	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Sandford 35	6900	3975	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Schacht	6000	3500	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Service 275	7100	4200	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Service 76	7100	4200	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Signal M	7300	4100	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Standard 66	6600	3675	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Stirling	6850	3500	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Tiffin FW	6350	3760	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Titan	7350	4300	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Tower G	6800	4100	Cont	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
Union Cy 4 Wh. DB	7200	4750	Wis	4	5 1/2 x 5 1/2	42	4	1 1/2	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79
United CX	7000	3950	Buda	4	4 1/2 x 5 1/2	32.4	3	1 1/4	1	0	T	FS	Strm	Elism	....	W	Warn	4	Spic	W	Timk	180	Math	36x5	36x5D	Ross	Simp	79

Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	P. Cent of Weight on Rear Wheels
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4 Ton—Continued

Parker	7100	4250	Cont	6	3 1/2 x 5 1/2	33.7	3	1/4	T	T	Sp	Strm	Dix	West	D	Selec	4	Spic	W	Own	160	Tut	36x5	40x5D	Ross	Pier	85
Riker	7200	4700	Own	4	4 1/2 x 6	32.4	3	1/4	T	T	Sp	Strm	B&B	West	D	Selec	4	Own	W	Own	150	Opt	36x5	36x5D	Ross	Own	77
Sanford 50	7400	4700	Cont	4	4 1/2 x 5 1/2	32.4	3	1/4	T	T	Sp	Strm	Bosh	West	D	Selec	4	UP	W	Own	174	Math	36x5	36x5D	Ross	Dup	75
Union C	6600	3500	Wis	4	4 1/2 x 6	28.9	3	1/4	T	T	Sp	Strm	Bosh	West	D	Selec	4	UP	W	Own	171	Math	36x5	36x5D	Ross	Dup	75
Winther 88	7600	4200	Wis	4	4 1/2 x 6	28.9	3	1/4	T	T	Sp	Strm	Bosh	West	D	Selec	4	Bld	I	Cl	156	Math	36x5	36x5D	Ross	Dup	80

4 1/2 Ton

Winther 479	8900	4900	Wis	4	4 1/2 x 6	28.9	3	1/4	T	T	G	Mas	Eism	Bij	B	Full	4	Bld	I	Cl	158	Math	36x5	36x5D	Ross	Dup	65
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5 Ton

Acason M	8350	4750	Wau	4	4 1/2 x 6 3/4	36.1	3	1/4	T	Can	Sp	Shel	Eism	...	B	Cott	3	Bld	W	Timk	187	Det	36x6	40x6D	Ross	Wau	77
Acme E	8800	4975	Cont	4	4 1/2 x 6	36.1	3	1/4	T	GO	Sp	Rayf	Eism	...	B	Cott	3	Bld	W	Timk	180	Det	36x6	40x6D	Ross	Cont	80
Atterbury 5 E	9635	4975	Cont	4	4 1/2 x 6	36.1	3	1/4	T	T	Sp	Strm	Eism	...	B	Cott	3	Bld	W	Timk	167	SP	36x6	40x6D	Ross	Cont	98
Available 5	8800	4900	Cont	4	4 1/2 x 6	36.1	3	1/4	T	T	Sp	Strm	Eism	...	B	Cott	3	Bld	W	Timk	168	Mer	36x6	40x6D	Ross	Dup	...
Brockway T	8500	4850	Cont	4	4 1/2 x 6	36.1	3	1/4	T	T	Sp	Strm	Eism	...	B	Cott	3	Bld	W	Timk	174	Mer	36x6	40x6D	Ross	Dup	...
Clydesdale 120B	8500	5000	Cont	4	4 1/2 x 6	36.1	3	1/4	T	T	Sp	Strm	Eism	...	B	Cott	3	Bld	W	Timk	168	Opt	36x6	40x6D	Ross	Own	75
Corbitt AA	11,000	6500	Wis	4	4 1/2 x 6 3/4	42.4	3	1/4	T	H	Sp	Strm	Eism	G&D	B	Cott	3	...	W	Own	144	Tut	36x5D	40x6	Ross	...	60
Couple Gear	8600	4900	Cont	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Day-Elder E	8600	4900	Cont	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Diamond T-R	8300	5100	Wau	4	4 1/2 x 5 1/2	36.1	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Federal X	8870	5000	Cont	4	4 1/2 x 5 1/2	36.1	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Garford 68	8600	4950	Cont	4	4 1/2 x 5 1/2	36.1	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
G. M. C. 101-A	8200	4400	Wau	4	4 1/2 x 5 1/2	36.1	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
G. M. C. 101-B	8700	5000	Wau	4	4 1/2 x 5 1/2	36.1	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Gramm-Bernst.	7400	5000	Wau	4	4 1/2 x 5 1/2	36.1	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Hall	8900	5000	Buda	4	4 1/2 x 6	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Harvey WKA	7800	5250	Buda	4	4 1/2 x 6	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Hurlburt	9175	4900	Wau	4	4 1/2 x 6 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Kelly-Springfield	7600	4900	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Kissel	3900	1885	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Larrabee-Deyo	7900	4890	Buda	4	4 1/2 x 6	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Master B	8000	4950	Buda	4	4 1/2 x 6	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Menominee	9000	4725	Buda	4	4 1/2 x 6 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Moreland 19-J	8000	4750	Buda	4	4 1/2 x 6 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Nels & LeMoon F5	8000	5000	Opt	4	4 1/2 x 6 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Old Reliable	9315	4750	Opt	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Onelida E	8650	5150	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Packard 5-E	9000	5000	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Packard 5-E	9000	5000	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Pierce-Arrow	7225	5500	Buda	4	4 1/2 x 6	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Ralston	8000	5100	Buda	4	4 1/2 x 6	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Royal	7800	4775	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Sadow L	8000	4950	Buda	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Schacht	8800	5000	Cont	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Selden DL	8240	5000	Buda	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Service 300	8200	5100	Cont	4	4 1/2 x 6	36.1	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Signal B	8200	4650	Cont	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Standard 86	9600	5100	Ster	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Stirling	8400	5000	Cont	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Tiffin	9100	5150	Buda	4	4 1/2 x 6	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Titan	8000	4850	Wau	4	4 1/2 x 6 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Twin Cy. 4Wh. Dr. A	8500	4850	Wau	4	4 1/2 x 6 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
U. S. K.	8500	5000	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
White T G	7925	5000	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Wilcox W	9000	4600	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Wilson H	7500	4600	Wau	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73
Winther 109	8300	5000	Wau	4	4 1/2 x 6 3/4	36.1	3	1/4	T	L	Sp	Strm	Eism	...	B	Cott	3	...	W	Own	170	Det	36x6	40x6D	Ross	...	73

5 1/2, 6 and 7 Ton

Doane 1919	8500	5650	Wau	4	4 1/2 x 6 3/4	36.1	3	1/4	T	C	Sp	Mas	Bosh	...	Ch	Selec	8	D	Ch	Dead	178	Opt	36x6	40x6D	Lav	Wau	79
Hall	8000	4500	Cont	4	4 1/2 x 5 1/2	32.4	3	1/4	T	L	Sp	Strm	Eism	...	W	B-Li	4	K-B	W	Timk	180	Det	36x5	40x6D	Gem	Dup	...
Koehler 5 1/2	5000	4200	Wis	4	4 1/2 x 5 1/2	28.9	3	1/4	T	T	Sp	Strm	Eism	...	I	MM	4	K-B	I	Timk	186	Mer	36x6	40x6D	Own	Pier	75
Maccar 5 1/2	8000	5000	Wis	4	4 1/2 x 5 1/2	41.5	3	1/4	T	C	Sp	Strm	Eism	...	W	B-Li	4	K-B	W	Timk	186	Mer	36x5	40x6D	Ross	Dup	80

5 1/2, 6 and 7 Ton

Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Per Cent of Weight on Rear Wheels
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5 1/2, 6 and 7 Ton—Continued

Mack 5 1/2	8650	5250	Own	4	5x6	40	2 3/4	1 1/4	O	C	L	FS	Rayf	Bosh	4	Spic	W	C	Timk	105	Per	36x5	40x5D	Ross	Simp	50
Garford 6-ton	9350	5300	Wis	4	5 1/2x5 1/2	41.5	3 1/2	1 1/4	O	C	L	Sp	Rayf	Elism	...	...	...	4	Spic	C	Dead	128	Per	36x6	40x7D	Ross	Simp	53
Kelly-Springfield 6	9500	5200	Own	4	4 1/2x5 1/2	32.4	3 1/2	1 1/4	O	C	L	Fo	Rayf	Elism	...	...	...	4	Own	C	Dead	128	Per	36x6	40x7D	Ross	Own	58
Packard 6-E	8925	5400	Own	4	5x6 1/2	42.2	3 1/2	1 1/4	O	C	L	Fo	Rayf	Elism	...	...	...	4	Spic	C	Dead	136	SP	36x6	40x7D	Ross	Own	58
Royal 6-ton	9600	5200	Cont	4	5 1/2 x 8	42.2	3 1/2	1 1/4	O	C	L	FS	Rayf	Bosh	...	...	...	4	Own	W	Thel	168	Mer	36x6	40x6D	Ross	Mon	80
Tiffin 6-ton	9600	5200	Wis	4	3 3/4 x 5 1/4	33.7	3 1/2	1 1/4	O	C	L	FS	Rayf	Bosh	...	...	...	4	Acme	W	Thel	168	Kal	36x6	40x12	Ross	Dup	80
Winther 149	9600	5200	Wis	4	5 1/2 x 8	42.2	3 1/2	1 1/4	O	C	L	Fo	Rayf	Elism	...	...	...	4	Bid	C	Dead	144	Math	36x6	40x14	Ross	Own	65
Couple Gear 6	11,000	7200	Own	4	5 1/2 x 7	44.1	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	4	Own	On	Own	144	Tut	36x5D	40x7	Ross	Own	65
Mack 7	10,950	5500	Wau	4	4 3/4 x 6 3/4	36.1	3 1/2	1 1/4	O	C	L	FS	Rayf	Bosh	...	...	...	4	Spic	C	Dead	124	Shel	36x6	40x7D	Ross	Wau	...
Old Reliable CP	10,240	6000	Own	4	5 1/4 x 7	44.2	3 1/2	1 1/4	O	C	L	FS	Rayf	Bosh	...	...	...	4	Spic	W	Thel	168	Mer	36x7	40x7D	Ross	Mon	...
Royal 7	12,000	5400	Beav	4	4 1/2 x 6	32.4	3 1/2	1 1/4	O	C	L	FS	Rayf	Bosh	...	...	...	4	...	...	...	165	...	36x7	40x6D	Ross	Dup	...

Gasoline Tractor-Trucks

Columbia T	4000	2350	Cont	4	4 1/4 x 5 1/4	27.2	3 1/2	1 1/4	O	C	L	FS	Shk	Dix	...	...	...	3	Spic	I	Russ	112	Per	36x4	36x6	Own	Pier	...
Garford 70T	4750	3400	Buda	4	4 1/4 x 5 1/2	28.9	3 1/2	1 1/4	O	C	L	Sp	Rayf	Elism	...	...	...	3	Spic	W	Timk	119	Per	36x4	36x7	Own	Simp	...
Garford 77T	6990	4400	Wis	4	4 1/4 x 5 1/2	36.1	3 1/2	1 1/4	O	C	L	Fo	Rayf	Elism	...	...	...	3	Spic	C	Dead	105	Per	36x5	40x6D	Own	Simp	...
Garford 68T	8450	5100	Wis	4	5 1/4 x 5 1/2	41.5	3 1/2	1 1/4	O	C	L	Fo	Rayf	Elism	...	...	...	3	Spic	C	Dead	105	Per	36x6	40x6D	Own	Simp	65
Hood	2800	1400	Own	4	3 3/4 x 3 3/4	22.5	3 1/2	1 1/4	O	C	L	Sp	Rayf	Elism	...	...	...	3	Plan	C	Timk	60	Lah	20x3 1/2	20x3 1/2	Own	...	...
Knox 35	8500	5500	Own	4	5x5 1/2	40	3 1/2	1 1/4	O	C	L	Fo	Rayf	Elism	...	...	...	3	...	C	Timk	108	...	36x4	36x6	Own	...	...
Knoel 3-ton	10,000	6000	Own	4	5x5 1/2	19.6	3 1/2	1 1/4	O	C	L	Fo	Rayf	Elism	...	...	...	3	...	C	Timk	108	...	36x4	36x6	Own	...	...
Knoel 3-ton	3000	1750	Own	4	3 1/2 x 5	19.6	3 1/2	1 1/4	O	C	L	Fo	Rayf	Elism	...	...	...	3	...	C	Timk	106	Opt	36x3	36x6	Own	...	...
Koehler 5-ton	3900	2165	Own	4	4 1/4 x 5 1/2	28.9	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	106	Opt	36x3	36x6	Own	...	...
Kuhn	9000	5000	Wis	4	4 1/4 x 5 1/2	28.9	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	106	Opt	36x3	36x6	Own	...	...
Lapeer (3-ton)	3057	2000	Wau	4	3 1/2 x 5 1/4	19.6	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	138	...	36x7	36x7	Own	...	...
Lapeer (5-ton)	3400	2700	Wau	4	4 1/2 x 5 1/2	25.6	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	88	...	36x7	36x7	Own	...	...
Lombard	8000	...	Spec	9	5 1/2 x 6 3/4	72.7	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	88	...	36x7	36x7	Own	...	...
Mack AB (5-ton)	4900	3000	Own	4	4x5	25.6	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	120	...	36x4	36x4	Own	...	...
Mack AC (7 1/2-ton)	7670	4600	Own	4	4x5	25.6	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	119	...	36x5	40x6D	Own	...	...
Mack AC (11-ton)	8250	5200	Own	4	5x6	40	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	119	...	36x7	40x7D	Own	...	...
Mack AC (15-ton)	8650	5500	Own	4	5x6	40	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	119	...	36x7	40x7D	Own	...	...
Ralston 6-ton	4000	2950	Buda	4	4 1/4 x 5 1/2	28.9	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	116	Row	36x5	36x7	Own	...	...
Renroc 8-ton	5050	2850	Buda	4	4 1/4 x 5 1/2	27.2	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	116	Row	36x5	36x7	Own	...	...
Ross E 8-ton	3800	1850	Own	4	4 1/4 x 5 1/2	28.9	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	140	Math	40x6	40x6D	Own	...	...
Walker 4-Wh Drive	8500	5500	Own	4	4 1/2 x 6 1/2	32.4	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	80	Shel	36x4	36x6D	Own	...	...
Watson	6500	4050	Cont	4	4 1/2 x 5 1/2	32.4	3 1/2	1 1/4	O	C	L	FS	Rayf	Elism	...	...	...	3	...	C	Timk	80	Shel	36x4	36x6D	Own	...	...

Electric Commercial Cars

Name and Model Number	Carrying Capacity	Chassis Weight	Chassis Price	Maximum Speed	Battery	Mileage Per Charge	Motor	Controller	Speeds Forward	Drive	Rear Axle	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Per Cent of Weight on Rear Wheels
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Ward WS	750	1400	2270	12	Edis	40	West	West	4	B	Timk	Shel	32x3	32x3	Own	88	60
C. T.	1000	1800	2270	14	Opt	60	West	West	4	B	Timk	Shel	36x3	36x3	Own	90	66
Walker	1000	2500	2745	15	Opt	60	West	West	4	B	Timk	Shel	36x3 1/2	36x3 1/2	Own	93	66
Ward WA	1000	2500	2745	13	Opt	60	West	West	4	B	Timk	Shel	36x4	36x4	Own	100	60
C. T.	2000	2500	2745	14	Opt	60	West	West	4	B	Timk	Shel	36x4	36x4	Own	96	66
Walker WB	2000	3420	2745	14	Opt	60	West	West	4	B	Timk	Shel	36x5	36x5	Own	102	60
Ward 2C	2000	3420	2745	11	Opt	60	West	West	4	B	Timk	Shel	36x3D	36x3D	Own	115	60
Atlantic 2C	4000	3590	3270	11	Opt	60	West	West	4	B	Timk	Shel	36x4	36x4	Own	116	66
C. T.	4000	3590	3270	13	Opt	60	West	West	4	B	Timk	Shel	36x4	36x4	Own	110	66
Walker	4000	3700	3270	10	Opt	60	West	West	4	B	Timk	Shel	36x5	36x5	Own	124	60
Ward WD	4000	4500	4595	10	Opt	60	West	West	4	B	Timk	Shel	36x5	36x5	Own	124	60
Atlantic 3C	7000	5000	4595	10	Opt	60	West	West	4	B	Timk	Shel	36x5 1/2	36x5 1/2	Own	132	55
C. T.	7000	5000	4595	7	Opt	60	West	West	4	B	Timk	Shel	36x6	36x6	Own	144	60
Ward WF	10000	9500	5800	10	Opt	60	West	West	4	B	Timk	Shel	36x6	36x6	Own	96	55
Atlantic 5C	10000	9500	5800	10	Opt	60	West	West	4	B	Timk	Shel	36x6	36x6	Own	96	55
Couple Gear	10000	10000	5800	10	Opt	60	West	West	4	B	Timk	Shel	36x6	36x6	Own	122	55
C. T.	10000	10000	5800	10	Opt	60	West	West	4	B	Timk	Shel	36x6	36x6	Own	122	55
Walker	10000	6300	5240	8	Opt	50	West	West	4	B	Timk	Shel	36x6	36x6	Own	144	60
C. T.	10000	6300	5240	16	Opt	50	West	West	4	B	Timk	Shel	36x6	36x6	Own	144	60
Ward WH	10000	8375	5400	7	Opt	30	West	West	4	B	Timk	Shel	36x7	36x7	Own	144	60
Couple Gear	10000	8375	5400	7	Opt	30	West	West	4	B	Timk	Shel	36x7	36x7	Own	144	60
Couple Gear	10000	10000	5500	10	Opt	30	West	West	4	B	Timk	Shel	36x6	36x6	Own	96	55

NEW COMMERCIAL CARS



Koehler Announces New Two and a Half Ton Worm-Drive Chassis

By C. P. SHATTUCK

New Model Lists at \$2965. Planning New Factory to Take Care of Increasing Production

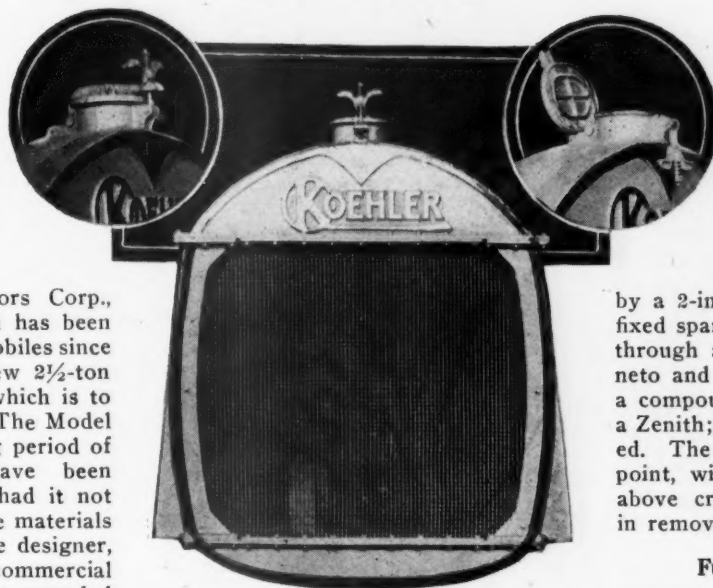
THE H. J. Koehler Motors Corp., Newark, N. J., which has been manufacturing automobiles since 1895, announces a new 2½-ton worm-drive chassis, which is to sell for \$2965 f. o. b. Newark. The Model M was completed after a long period of development and would have been marketed some months ago, had it not been that the war curtailed the materials market. Carl D. Peterson, the designer, who is well known in the commercial car field has produced what is regarded as a finished chassis and in which are incorporated many interesting and original features. It has been designed to meet exacting service with minimum operating cost, and all the components afford extreme accessibility.

Long-Lived Service Featured

The company estimates eight years of efficient and economical service for this model, against the conventional five. Automatically lubricating those parts generally neglected, and the use of high-grade material and workmanship, are factors making for long life. The absence of the conventional grease cup is noticeable. Large oil reservoirs, some containing a supply sufficient for months, lubricate such parts as the spring eye pins, clutch and brake pedal rocker shaft, etc.; in fact, wherever practical, all tubular members are utilized as oil reservoirs. A wick feed, as shown by an accompanying illustration, and original with the company, insures positive lubrication, as well as a clean bearing.

Has Five-Bearing Crankshaft

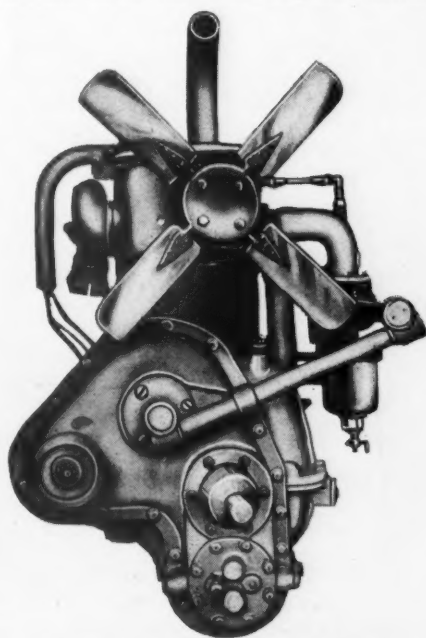
The engine is a Koehler design, a four-cylinder, 4 x 5½ in., rated at 35 hp. at 1200 r.p.m. It is a block casting, L-head type, with demountable cylinder head, and has a five-bearing crankshaft of chrome vanadium steel, heat treated. The bearings are bronze, backs lined with Fahrig metal. The piston pin bearings are Non Gran, and the rings the American Hammered. The other com-



The New Type of Koehler Radiator is Oval-Shaped

Showing also the practical filler-cap and lock, a Koehler development

ponents are conventional. The cooling fluid is circulated by a gear-driven pump and cooling is further assisted by an adjustable 18-in. roller bearing fan, driven



Front View of Koehler Engine, Showing Trunnion Support, Solid Shaft Drive of Governor and Large Fan

Special Timken Worm-Drive Axle, Wick Oiling and Four-Speed Gear Set Are Features

by a 2-in. fabric belt. Ignition is by a fixed spark high-tension magneto, driven through a flexible coupling. The magneto and pump are mounted tandem on a compound bracket. The carburetor is a Zenith; inlet manifold hot water jacketed. The suspension of engine is three-point, with forward support trunnioned above cross member, making for ease in removal.

Full Force-Feed Lubrication

A full force feed system of lubrication is employed, the oil being circulated by a gear pump driven off the camshaft. The oil is taken from the sump in the crankcase, and forced to the main camshaft bearings through the crankshaft to tubes to the piston pins and timing gears. The oil reservoir capacity is six quarts. An innovation is the use of a lever high up on the left hand side of the engine, for operating the petcock, indicating the high oil level, avoiding the usual stooping. The governor is a Simplex with grid valve, and a solid shaft drive is utilized. The governor is set at 14 m.p.h.

The clutch is a Brown-Lipe, 10-plate, dry disk type, enclosed in a housing bolted to the engine. A double fabric universal connection is employed between the clutch and the transmission, and its spiders are drop forged. The tubular portion of these is an alloy steel, heat treated, and the tubular shaft is anchored. The fabric is held to withstand a wind of five degrees.

Four-Speed Gear Set

A Brown-Lipe transmission is used, affording four forward gear ratios and reverse, with direct drive on the fourth. It is located amidships, mounted under two pressure steel cross members, and suspended at three points. By displacing four bolts and disconnecting universal, the gearset can be dropped. The usual breather is provided, and a feature is the use of a side oil filler, enabling easy renewal of the oil supply. The

gear ratios are as follows: Fourth, 1:1; third, 1.5:1; second, 2.62:1; first, 4:1; reverse, 4.81:1. The final gear ratio is 9.25:1. Provision is made for a power "take off" at transmission for body hoist, etc., and for driving speedometer from transmission shaft.

A straight line drive is provided by the propeller shaft, having three Spicer universal joints. The center member has a No. 407 S. K. F. self-aligning annular ball bearing, with its container carried in a large cross member. This support prevents whipping of the shaft and the construction is readily demounted when desired.

New Type of Timken Axle

Claim is made that the Timken David-Brown full floating worm-driven rear



A Splined Worm-Gear Replaces the Conventional Type in the Rear Axle

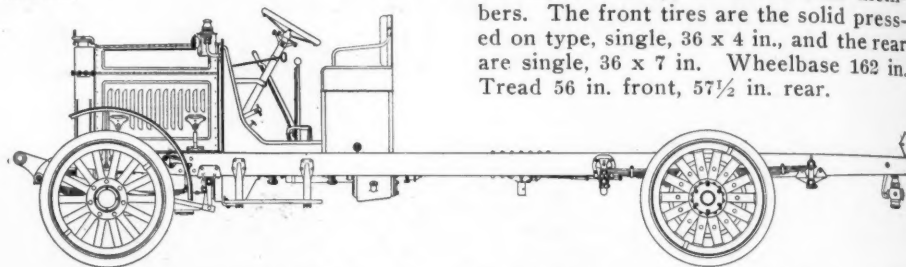
axle is the first one of 2½-ton capacity to be produced for service. It incorporates the feature utilized in the Liberty truck design, that of anchoring the worm gear to the differential by splines, and retaining it between the differential flanges by rivets. The service and emergency brakes are the Duplex expanding type, operating in 18-in. flanged drums, and are lined with Thermoid. The brake and clutch pedal pads are drop forged, 5½ in. wide.

The spring suspension is unusually sturdy and well designed. All leaves are of chrome vanadium, heat treated and ground. The front members, as well as the rear, are practically flat, and 40 in. long, 2½ in. wide, and have 10 leaves. The rear springs are 56 in. long, 3 in. wide, and have 12 leaves. The pressure blocks are of the arched type, and the spring clips are of 3½ per cent. spring steel, heat treated. A railroad type of lock washer is employed, and the S. A. E. nut is said to be one and one-half times the conventional height.

Brackets Well Anchored

The front rear spring brackets are unusually well anchored, and being reinforced by a tubular cross member, avoid the possibility of shearing stresses being communicated to the retaining members. The cross member also reinforces the frame at a point most desirable

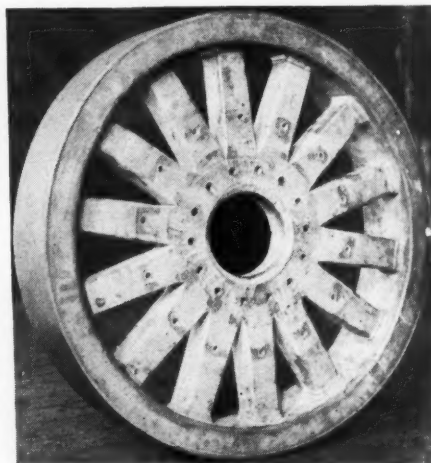
with the Hotchkiss form of drive. A noteworthy feature is that none of the spring eye pins, which are hardened and ground and carried in bushings, project beyond the hangers, and they are also free of projecting lubricating devices, for, as previously pointed out, the oil supply is contained in the hollow tubular member and fed through wicks to the frictional surfaces, and only when the bushing moves.



The Koehler Two and a Half Ton Chassis Includes Many Interesting Features and Refinements, Including Provision for Automatic Lubrication, Etc.

The frame is a pressed steel channel section of ¼-in. alloy steel, heat treated. It is 6-16 in. deep, with flanges varying from 2 in. to 3¾ in. at points of greatest stress. It is of the rigid type, but back of the rear spring front bracket it is semi-rigid or flexible, to compensate for weaving stresses and inequalities of the road. Very few rivet and

Wood wheels are used with two-piece felloes, and metal felloe connectors are used, both front and rear, obtaining weather proof joints and durability. The rear wheels are fitted with metal spoke sockets, affording a larger area of contact at felloe, and avoiding the possibility of spokes becoming loose under the most severe service. There are twelve 2-in. square spokes in the front wheels, and a like number of 2½ in. in the rear members. The front tires are the solid pressed on type, single, 36 x 4 in., and the rear are single, 36 x 7 in. Wheelbase 162 in. Tread 56 in. front, 57½ in. rear.



Two-Piece Felloes Are Employed With Metal Connectors and Metal Spoke Sockets

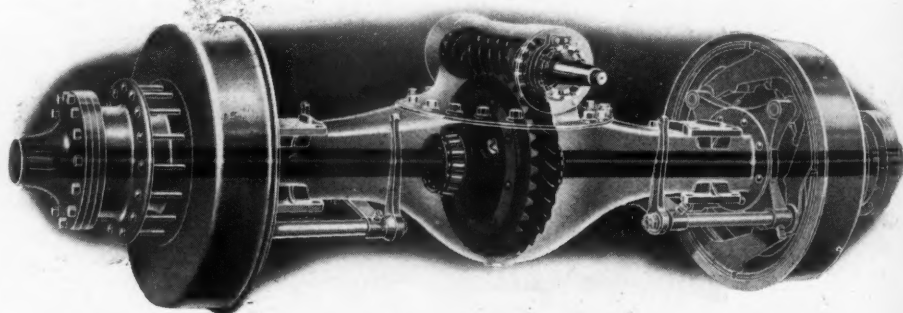
bolt holes are noticed, and these do not affect the sturdiness of the frame. The width is 34 in., and 144 in. are provided back of the driver's seat.

The fuel supply is by gravity from a 20-gal. welded tank, tinned inside and out, and mounted on saddles carried on cross members to prevent weaving stresses and road shocks being communicated to it. All fuel and oil connections are of the solderless type. The fuel shut-off valve is located on the outside of the seat box, just above the frame, and a dial indicates the On and Off positions of the lever.

The front axle is a Timken. The drag link connections are of the spring tensioned ball and socket type, with 1½-in. diameter balls. The steering gear is of the split nut type, surmounted by a 20-in. wheel, and the entire assembly can be dropped out of its bracket if desired. The driver is placed at the left, with center control. Control of the fuel supply is by a ratchet-type of lever on steering wheel, and by an accelerator having a 2½-in. pad or button, and conveniently located to the brake pedal. The use of the accelerator marks a departure for the company, as in the past it was not standard equipment. An exhaust type of signal is provided, it being operated by a lever or rod extending through dash to the steering column, and convenient to the driver.

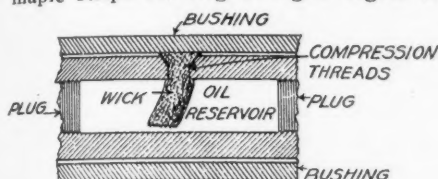
Dash, Gun Stocks and Seat-Box Metal

The dash and gun stocks are integral, of metal, electrically spot welded, and the seat box is similarly constructed. The last named is a separate unit and anchor-



Phantom View of Timken Two and a Half Ton Rear Axle, Showing Method of Retaining Worm Between Differential Flanges

ed by four bolts. A cab may be substituted for the box. The construction of gun stocks and seat box is adapted to fore doors. The seat cushion is 46 in. wide and 18 in. deep, and the springs are covered with a durable weatherproof material, over a thickness of felt. The leg room is ample, 26 in. The floor and toe boards are retained by wing nuts, facilitating removal and replacement, and maple strips running at right angles to



Wick Feed Employed on Spring Eye Pins, Clutch and Brake Rocket Shaft, Etc.

The oil supply is determined by the degree of compression and movement of bushing

frame afford a more secure footing, as well as keep the driver's feet dry and warm. The running boards, which are retained by extra wide and heavy step hangers, have maple strips, also a mud scraper.

Novel Radiator Filler Cap

A new style of radiator is offered, an oval design of the armored, built-up type, and so mounted that road shocks are absorbed by the suspension. The filler cap provides an opening of $2\frac{1}{2}$ x

$3\frac{1}{2}$ in. It is of unique construction. The cap proper is lined with a cork gasket, and is pivotally mounted on a hinged arm, which is locked by a hinged member carrying a coil spring, the tension of which exerts such uniform pressure on the pivot of the cap as to seal the

A Five Bearing Crankshaft is Utilized in the Koehler Engine, and the Bearings Are Liberal in Size.



opening; that is, the pressure is applied at the center of the cap, not at the ends or sides. It is quickly and easily operated and rattle proof.

Much attention has been paid to avoiding the possibility of rattling after the chassis has been in service for a considerable period. Those components, such as the brake and clutch pedals, assembly, brake rods, starting crank, etc., are provided with anti-rattling devices to automatically compensate for wear, and anti-squeak material is employed under the dash, radiator, hood, seat box, etc. The hood ledges are of metal, and the hood is of heavy stock, with welded hinges. Provision is made for locking the hood in a raised position, thereby avoiding the possibility of injury to the driver when making an in-

spection of the engine, etc. The hood catches are very practical.

The bumper is a tubular steel bar, and is carried in brackets integral with the front spring horns, preventing rattling and making for a neat appearance. The ends of the bumper do not project be-

yond the fender and hubs, even when the truck is turned sharply. The fenders are of heavy material, and the braces are of steel bolted to the frame. The dash carries a heavy type of kick ignition switch. The oil gauge, oil lamps, side and tail, are well anchored. Provision is made for electric starting, and an odometer may be attached to either right or left front wheel hubs, which are of the steel bolted-on type. A standard color is provided, with lead as optional. A pressed steel tool box and complete set of tools are supplied.

The Model M replaces the Model L of the Koehler line, which includes the Model K, $1\frac{1}{2}$ ton; O, $3\frac{1}{2}$ ton, and K. T., 3-ton tractor, and M. T., a 6-ton tractor. The company is planning for a new factory to care for increasing production.

Bessemer Motor Truck Company Producing New Two and a Half Ton Model

THE Bessemer Motor Truck Company, of Grove City and Philadelphia, is now offering to the trade a new $2\frac{1}{2}$ -ton model, known as their model "J-2."

Incidentally this size of truck is a departure from their established series of models. Up to the present time this company has been following the conventional series of ratings: 1-, $1\frac{1}{2}$ -, 2- and $3\frac{1}{2}$ -ton. They now propose to make a change from this series, and their reasons should be interesting to both the manufacturer and the dealer.

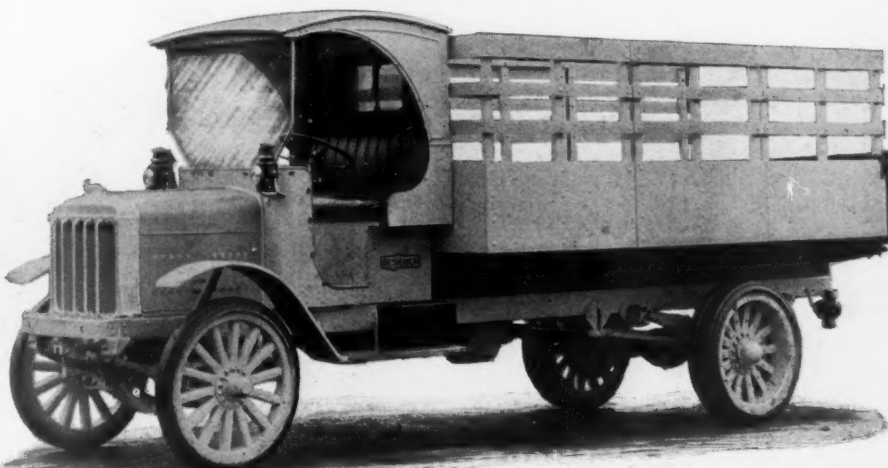
The claim made by this company is that the ideal series of trucks should advance in capacity according to geometrical ratio; that is, each truck in the series should be the same percentage greater in capacity as its predecessor. An examination of the conventional sizes shows that the percentage of increase from 1- to $1\frac{1}{2}$ -ton is 50 per cent., while the percentage of increase between the $1\frac{1}{2}$ - and 2-ton is only $33\frac{1}{2}$ per cent., and the difference in size from 2- to $3\frac{1}{2}$ -ton is 75 per cent. Thus we have differences in capacities varying from $33\frac{1}{2}$ per cent. to 75 per cent.

New Series to be Built in Four Sizes

The Bessemer Motor Truck Company proposes to adopt a closer approxima-

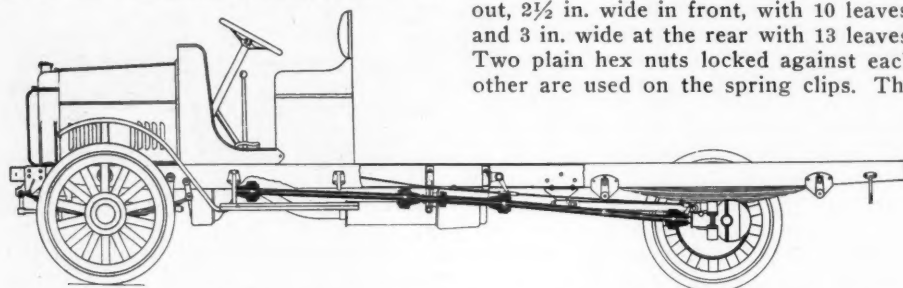
tion to an even grading of capacities by increasing the capacities on the two larger models. Thus, the new line will consist of a 1-ton, $1\frac{1}{2}$ -ton, $2\frac{1}{2}$ -ton and 4-ton truck. A comparison of these sizes shows a percentage of increase as follows: 50 per cent., 66 2-3 per cent., 60 per cent. It is also claimed that while this causes a very even advance in capacity from one truck size to another,

that the line terminates in this way with a 4-ton size, which is a sufficiently heavy model to meet practically all requirements. In this way a very large range of capacity is covered by four models. The service and production problems are thus correspondingly simplified. Because of the moderate weight of the 4-ton model, hostile legislation will never affect its sale.



The New Bessemer Two and a Half Ton Model

The 2½-ton model, herewith described and illustrated, has in itself some very interesting features. The foremost claim made is that there are no experiments on the car, and that nothing but time-tried and thoroughly seasoned devices are used in any part of its construction. It is an assembled product, and the



This View Illustrates the Practically Straight-Line Drive From Engine to Rear Axle

general quality tone can be judged from the following list of units:

- Engine—Continental C-2.
- Carburetor—Rayfield LL-3.
- Ignition—Bosch DU-4.
- Fan—Automotive Parts Company.
- Clutch—Borg & Beck, 12 in.
- Propeller Shaft—Arvac No. 19.
- Transmission—Brown-Lipe Model 50, four speed.
- Axles—Front, Shuler No. 510; rear, Torbensen Model CT.
- Springs—Perfection.
- Wheels—Schwarz wood wheels are standard on 1-, 1½- and 2½-ton sizes. Metal wheels are optional on the 2½-ton size, and standard on the 4-ton size.
- Frame—Parish & Bingham.

Spring Lubrication

The new model is provided throughout with wick oiling reservoirs on all spring pins and also on all four rear shackles, which require filling once a month.

The rear spring shackles are provided with an oil reservoir in the shape of an annular space between the shackle itself and the shackle bushing. A lubricator is placed in the top of the bushing barrel for filling, and a wick is situated in the top of the bushing so that as the motion of the truck agitates the oil the wick becomes saturated and so feeds to the wearing surface. In this way lubrication stops as soon as the trucks stop, and the amount of lubrication will be in direct proportion to the amount of vibration or movement of the shackle.

As will be noted from the illustrations, this truck is provided with radius rods to take the drive. Provision is made on these rods for universal action to accommodate unequal compression on the rear springs. The wearing surface at each end of these radius rods is also provided with wick lubrication. An eye bolt at the front end is free to rotate in the front radius rod bracket, in order that the radius rod itself may freely adjust

itself to any angularity of the axle due to unequal loading or uneven spring action. The thrust of the radius rod against the bracket is cushioned by heavy leather washers. Also, the use of this washer gives a provision for adjustment of the length of the radius rod.

The springs are bronze bushed throughout, 2½ in. wide in front, with 10 leaves, and 3 in. wide at the rear with 13 leaves. Two plain hex nuts locked against each other are used on the spring clips. The

advantage claimed for this construction is that in case of stretch of the spring clips these two nuts are still tightly bound and will not work loose. A similar locking device is used on the spring cross shafts at the rear of the truck. Instead of having a shoulder on the cross shaft and using shims between the shackle and the shackle nut to make up for variations in frame width, two nuts are used, locking against each other, and these may be readily adjusted to meet variations in frame width and still leave the shackle perfectly free. As an addition in precaution, the outer nut is slotted and cottered.

The brake equalizing shaft is provided with oil-less bushings, thus eliminating the necessity of crawling under the truck in order to lubricate these parts.

As will be noted from the illustration, the dash is of metal construction and is carried around the sides with a pleasing sweep, thus giving the driver ample protection. This dash is of heavy metal and thoroughly braced so as to prevent rattling.

The radiator core is protected by a guard of such weight that it will bend or buckle before cracking the radiator casting. These parts are individual and may be removed and straightened.

The fenders are made in one pressing, of 16 gauge metal, and derive extra strength from the crowned section. They are supported at the front by single channel-section malleable brackets. At the rear they are bolted to the metal running board. This running board, of 12 gauge metal, is re-enforced in such a way as to be very rigid, and is riveted directly to the hangers.

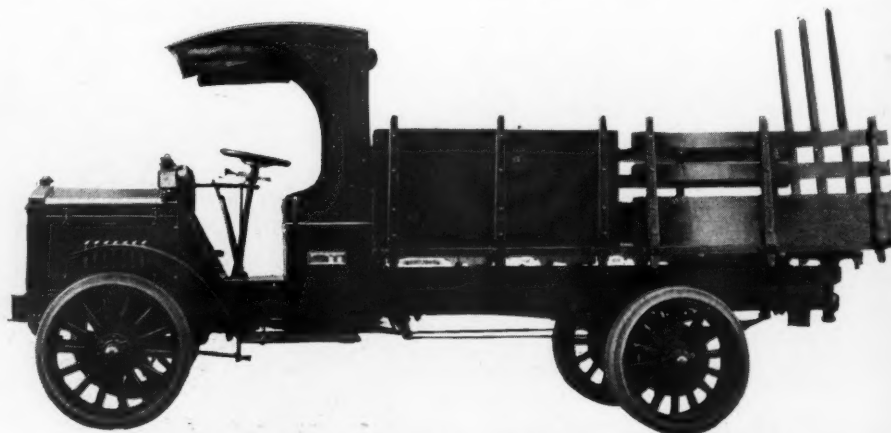
Attention is called to the sectional drawing showing the inclined position of the transmission. This layout permits of a practically straight line drive, the maximum angularity at any of the propeller shaft joints not exceeding 2½ deg. The transmission is located amidships, which makes possible comparatively light rear propeller shaft. The rear axle is provided with the M. & S. differential. This model can be furnished in two wheelbases, 158 in. and 175 in.

Conestoga One and Two-Ton Chassis

THE illustrations accompanying this article shows views of the 1- and 2-ton jobs built by the Conestoga Wagon Works, for which the First National Sales Corporation, of Lancaster, Pa., is the sole distributor. These models are known as Model 20, 1-ton chassis, listing at \$1850, and Model 30, 2-ton chassis, listing at \$2550.

The Model 20 has a wheelbase of 118 in. The length of space in back of cab is 96 in. and the standard loading space is 108 in. The chassis weight is 3300 lb. The normal load is 2000 lb., and the allowable body load 1000 lb.

It is powered by a Continental 3½ x 5 L-head engine, equipped by a Bosch magneto and a Zenith L-4 carburetor. Other specifications of this model include

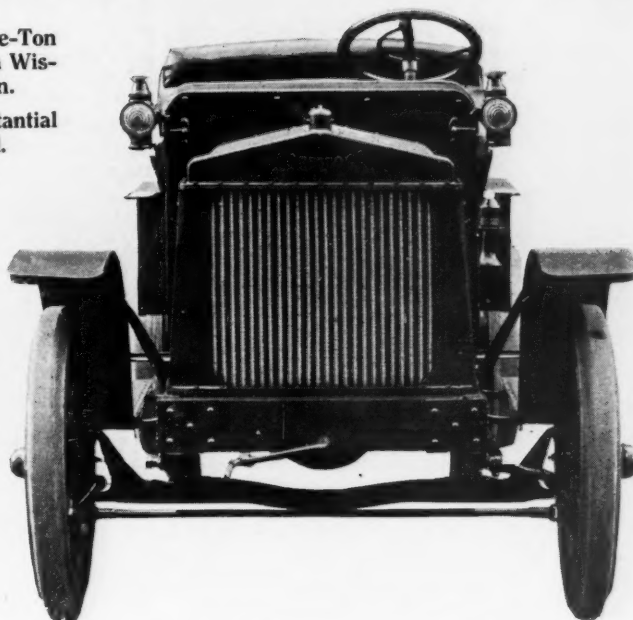


Side View of a Two-Ton Conestoga Chassis With Straight Body
The wheelbase is 136 in.; length of frame back of shaft 120 in.; standard loading space 132 in.

Fuller TU $\frac{3}{4}$ heavy duty transmission; Fuller multiple disk dry plate clutch; English & Mersick individual core radiator; Ross Gear & Tool Co. 18-in. steering wheel, fitted with double controls; two propeller shafts, made by Bearings

Left: Rear View of the One-Ton Model 20. Rear Axle is a Wisconsin; $7\frac{3}{4}$ to 1 Reduction.

Right: Showing Substantial Construction of Front End.



Co. of America, fitted with heavy truck universal joints; 5-in. steel channel frame with four cross members; semi-elliptic springs front and rear, 36 x 2-7 leaves, in front, 48 x $2\frac{1}{2}$ -9 leaves in rear; I-beam front axle, with Wisconsin worm drive rear axle, $7\frac{3}{4}$ to 1 reduction mounted on Strom ball bearings; internal service and emergency brakes, $2\frac{1}{2}$ in. wide; twelve spoke artillery wheels, $1\frac{5}{8}$ in. diam. in front, and fourteen spoke, 2-in. diam. in rear; tires solid, 34 x $3\frac{1}{2}$ in.

front, 34 x 5 rear; gasoline tank capacity, $16\frac{1}{2}$ gal.

Specifications of Two-Ton Chassis

The normal load is 4000 lb., body allowable 1200 lb. and chassis weight 4000 lb. The wheelbase is 136 in., length of frame back of cab, 120 in.; standard loading space, 132 in. The engine is a $3\frac{3}{4}$ x 5 Continental. The propeller shaft is of the three joint type, carried by Hyatt bearings in grease tight housing. The uni-

versal joints are Bearings Company of America's make. The frame is a 6-in. channel section, reinforced with 5 cross members. The springs are 40 x $2\frac{1}{2}$, 9 leaves, front, and 52 x 3, 11 leaves, rear; Wisconsin worm drive axle, 9 2-3 to 1 reduction; wheels are made up of 14 spokes, $1\frac{3}{4}$ in. diam. in front, 14 spokes, $2\frac{1}{2}$ in. diam. in rear; solid Firestone tires, 36 x 4 in front, 36 x 4 dual, rear. Other specifications are exactly the same as for Model 20.

United States Announces One and a Half Ton Model at \$1995

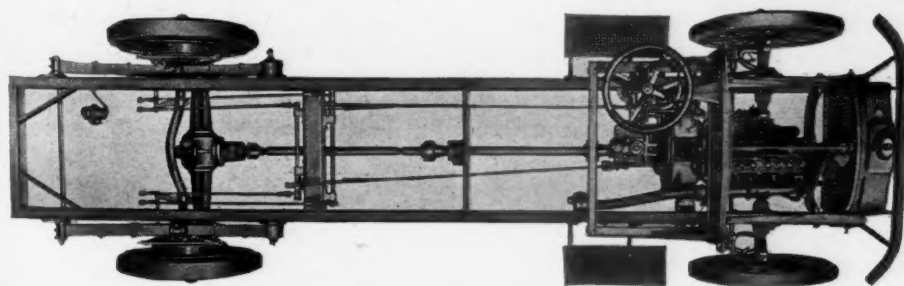
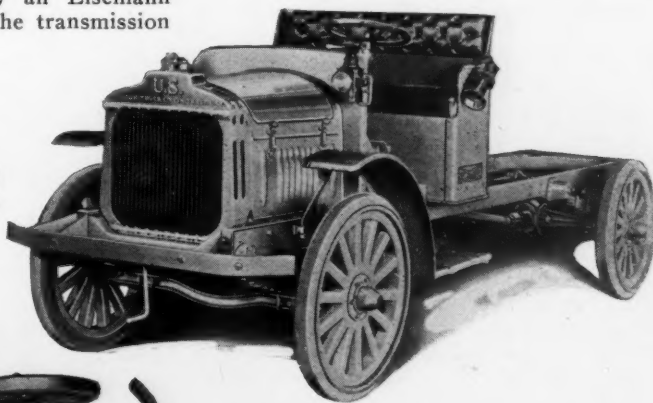
THE United States Motor Truck Co., of Cincinnati, O., has just added to its line a $1\frac{1}{2}$ -ton job, Model N, designed for all kinds of light or medium weight hauling. The makers call particular attention to the fact that in designing this job no attempt was made to build a truck which would compete with similar sized trucks in price. Throughout the entire design, quality has been kept uppermost in mind and oversized parts are the rule rather than the exception.

The engine is a four-cylinder cast in block, L-head with enclosed valves, $3\frac{3}{4}$ -in. bore by 5-in. stroke; weight complete with flywheel and regular equipment is 410 lb. A vertical tube radiator with cast

tanks and frame, centrifugal water pump and fan comprises the cooling system. The carburetor is a Stromberg and the ignition is furnished by an Eisemann high-tension magneto. The transmission

is of selective sliding gear type, three speeds forward and one reverse, bolted to the engine and forming a unit power

Note the Steel Seat and Dash, and Sturdy Looking Design.



Plan of the United States One and a Half Ton Job

plant. The clutch is of multiple disk dry plate type, faced with asbestos fabric.

The frame is pressed steel with all hangers and cross members hot riveted. A section is 5 in. thick with $2\frac{1}{2}$ -in. flange, $\frac{1}{4}$ -in. stock. Four cross members are used. Springs are semi-elliptic, being 38 $\frac{1}{2}$ in. long, $2\frac{1}{2}$ in. wide in front, and 54 x $2\frac{1}{2}$ in. in the rear.

The front axle is an I-beam forging with Timken roller bearings. The rear

axle is of internal gear drive type. All brakes are on the rear wheel. The service brakes are external contracting, and the emergency brakes are internal expanding.

Tires are of the solid pressed on type. 36 x 3½ front and 36 x 5 rear. A 20-gal gasoline tank is located under the driver's seat.

The wheelbase is 144 in. Loading space to end of frame 120 in. Equipment

includes three oil lamps, tool box, tool kit and horn.

Among the features noted on this truck are steel bumpers, steel dash and seat; an exceptionally small and simple muffler; propeller shaft equipped with three universal joints. The price is \$1995, f.o.b. Cincinnati, plus war tax.

Cab top, pneumatic tires and electric lighting and starting system, may be had if desired, at extra cost.

The engine is a four-cylinder, Continental Red Seal military type, cast in block, bore and stroke 3¾ x 5; thermosiphon cooling and force feed oiling system. Ignition is by the Dixie high-tension magneto fitted with an impulse starter. The carburetor is a Zenith, automatic float type, with hot air, quick starting device. The radiator is of cellular type, mounted on cushions with floating spring suspensions. The core is protected by triangular steel guards. The transmission is a Fuller of unit power plant type; selective sliding gear, three speeds forward and one reverse. The clutch is a Fuller, dry disk. The drive is through two universal joints with two-inch tubular shaft; Hotchkiss type. A steady bearing positively prevents whipping of drive shaft and eliminates wear on universal joints. The steering is by Lavine screw and unit, irreversible type; 18-in. wheel, left-hand drive.

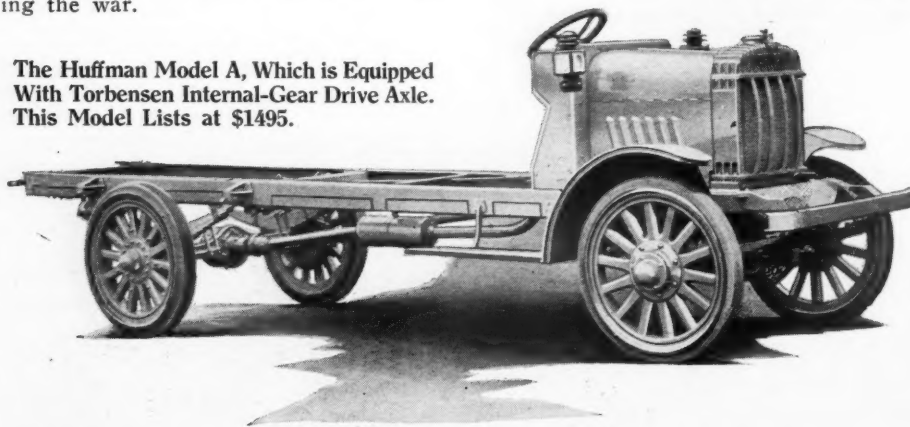
The frame is of straight side type, heat treated, pressed steel channels, 3-16 in. thick, semi-flexible. Length overall, 204

The Huffman Truck Furnished With Either Internal-Gear or Worm-Drive Axle

THE Huffman Brothers Motor Co., of Elkhart, Ind., are building two models, Models A and B, with a carrying capacity ranging from 2000 to 5500 lb.

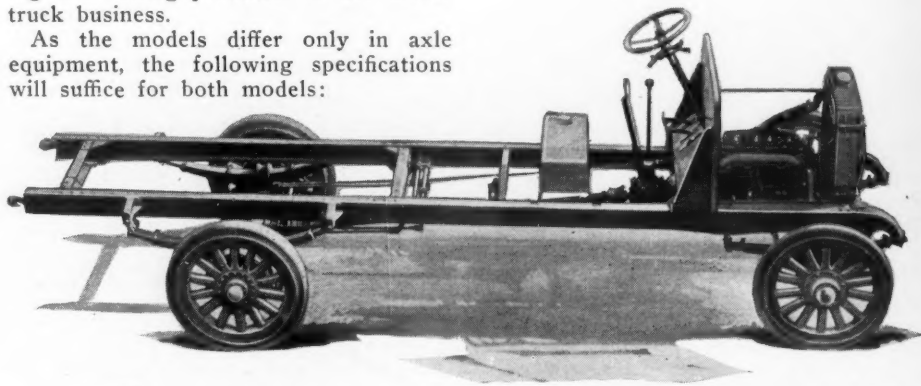
The Model A is equipped with the internal gear drive axle and lists at \$1495, while the Model B is equipped with a standard worm drive axle and lists at \$1695. These models are composed throughout of standard units and are assembled in the company's own factory, which covers thirteen city blocks and has a floor space aggregating 100,000 sq. ft. This factory is modern in every respect and the entire plant has been equipped with new machinery, especially with such machinery and labor saving devices which have been developed in the automatic machinery line during the war.

The Huffman Model A, Which is Equipped With Torbensen Internal-Gear Drive Axle. This Model Lists at \$1495.



Cawley; sales manager, N. L. Kuhn. These men have all been in the automobile business a number of years and thoroughly understand the manufacturing and selling problems of the motor truck business.

As the models differ only in axle equipment, the following specifications will suffice for both models:



Chassis Layout, Showing Displacement of the Various Units

in., 5½ in. deep, 2½ in. wide. The frame sides are connected with four heavy pressed steel cross members. The front cross member is removable to afford

The reason given by this firm for being able to hold its list price down to the figures given above, is that it takes full advantage of the 5 per cent. discount, given by part makers, for cash payment on arrival of goods. As cash is paid for everything, this makes quite a big reduction on the cost of each truck. This company further states that the financial men backing this institution and who are officers of this company, do not receive any salary.

The officers of the company are: President, W. L. Huffman; vice-president, Fred C. Huffman; treasurer, LeRoy Huffman; vice-president and general manager, R. S. Wiltrout; secretary, V. C.



A Line-up of Huffman Trucks in Front of the Factory, at Elkhart, Ind.

easy access to the engine. The front axle is an I-beam, drop forged, nickel steel; heat treated spindles. Timken taper roller bearings are used throughout.

Model A is fitted with Torbensen heavy duty internal gear drive axle; gear ratio is 8 to 1. The rear axle of Model B is a standard worm drive; gear ratio $7\frac{3}{4}$ to 1. The wheels are of the heavy artillery truck type, fourteen 2-in. square spokes in rear and fourteen $1\frac{3}{4}$ -in. spokes

in front. The rear springs are specially designed Perfection springs, 50 in. long and 3 in. wide, semi-elliptic, with 11 extra heavy leaves. Each leaf is cupped to prevent possibility of shifting, and Clemens bushings are fitted in all spring eyes. The front springs are 42 in. long, $2\frac{1}{2}$ in. wide, semi-elliptic, with 9 extra heavy leaves and single shackle in rear. Tires are Firestone, solid, 34 x 5 rear, 34 x $3\frac{1}{2}$ front. Sixteen gal. steel tank is located under driver's seat, gravity feed. Wheel-

base is 140 in. The loading space is $10\frac{1}{2}$ ft. from the rear of the driver's seat to the end of the frame. The height of the frame is 30 in. under load; tread 56 in., chassis weight 2000 to 5500 lb. The equipment includes tow-line hooks, tool kit, oil side lamps, and tail lamp. Pneumatic cord tires, steel bumpers, Prest-O-Lite equipment, and lazy back are furnished extra at nominal charge. Body building blue prints of chassis construction are furnished on request.

Special Body Designed by a Cleveland Dealer for Passenger Service

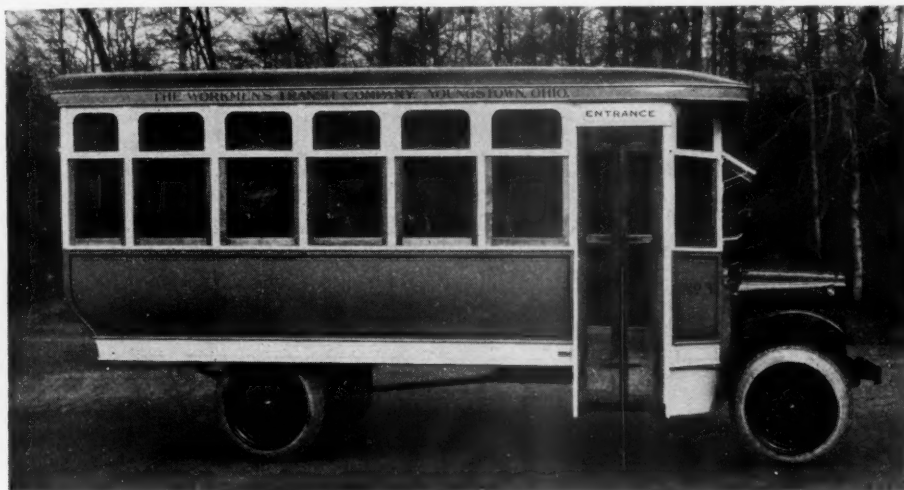
The Grant Truck Sales Co., Cleveland, Ohio, is giving considerable attention to the problems of transportation. Its policy is to study the problems of the truck prospect and sell him transporta-

ment orders, the workers had considerable trouble getting to the plant, which was $4\frac{1}{4}$ miles out of town. The transit employees were on strike and transportation facilities were in poor condition.

To remedy this condition the workmen got together and raised sufficient funds by popular subscription to start a transit company of their own. They

decided to use auto buses, and the Grant Sales Co. was asked to design a suitable body. This was done and the Gustave-Shaefer Wagon Co. built the body described herewith.

Several of these buses operate from the public Square in Youngstown to the plant of the Youngstown Sheet and Tube Co. They carry the employees, and are operated entirely by the employees with their own capital. A one-hour schedule is maintained, and the trucks cover about 160 miles a day.



* Motor 'Bus Used by Workmen of Youngstown, Ohio, Who Operate Their Own Transportation Company

tion with equipment that will best do the work. This Company's traffic engineer, R. M. Hawn, devotes all his time to working out the needs of prospects. He designs all special bodies and recommends the size of trucks that is needed to do work for which a buyer wants it.

The body shown in the illustration is the most attractive body running in the vicinity of Youngstown, Ohio. It was designed for the Workman's Transit Co., of Youngstown, Ohio.

It has complete equipment for the comfort of the passengers: a Perfection heater, headlights, spotlights, three dome lights in the body, farebox, gong, window curtains, plate-glass windows with translucent glass transoms, and push buttons. All the lighting is done from battery equipment.

The dimensions of the body are: 16 ft. 10 in. from the windshield to the rear; 7 ft. 4 in. wide, and 10 ft. 4 in. high. The height inside is 6 ft. 6 in. The body is mounted on a Grant truck, with an extended wheelbase of 160 in. The regular wheelbase on the Grant is 140 in.

Last year when the Youngstown Sheet and Tube Co. was working on govern-

Kelly-Springfield Tire Co., New York City, announces that directors of the company have voted to double the amount of common stock, increasing it from \$5,029,900, par value, to \$10,000,000, par value. The new stock will be distributed to shareholders in the form of dividends. It is intended to distribute three per cent. quarterly in new common stock at par of \$25 a share to common stockholders, in addition to the regular quarterly dividend of \$1 a share, beginning May 1. It is also proposed to reduce the authorized preferred stock from \$3,990,300 to \$3,900,300 by retiring and cancelling 900 shares of a par value of \$100 each, purchased for the company's "special surplus account."



Corbitt Five-Ton Worm-Drive Truck With Lumber Body

The above illustration shows a recent delivery made by the Corbitt Automobile Company, of Henderson, N. C. The Corbitt truck is well known all over the South. Recently this concern opened some very good accounts in New York, Boston and Philadelphia. This territory is looked after by D. C. Stevens, 1792 Broadway, who also handles the export business. The Corbitt Company builds a complete line of trucks, from one to five tons, all of which contain Sheldon worm-drive axles, Brown-Lipe transmissions, Continental engines, Rome-Turney radiators, Smith wheels, and other high-grade units. A 100 x 60 feet addition is being added to the main factory, while a service station, cafeteria and lunchroom has been recently completed.

Trailmobile Announces New Models

THE Trailmobile Company, of 538 E. 5th St., Cincinnati, Ohio, is announcing two new sizes of its Trailmobile, a Model K 2-ton, and a Model L, 3½-ton. Both are reversible, and are identical in design and construction but different in dimensions. In both, the pull of the truck is exerted upon the frame but the steering is done from the axle.

In the Trailmobile the spring shackles are fixed at one end. This feature and the patented steering mechanism prevent sideway even at high speeds. It saves power, saves wear and tear on the vehicle, and keeps the load on the Trailmobile and in good order under conditions where it might otherwise be displaced.

General Description of Both Models

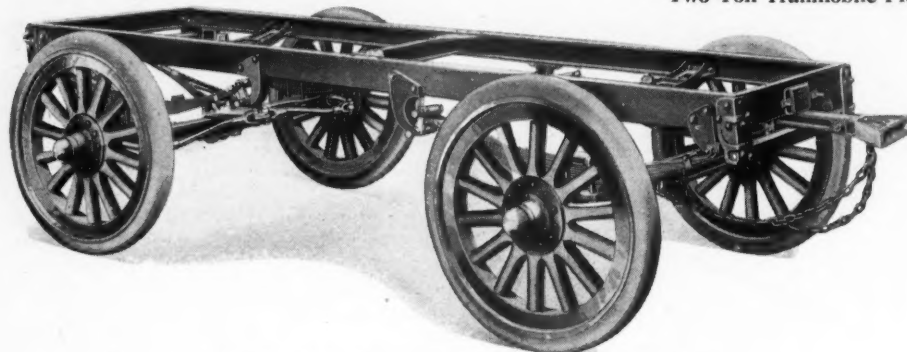
The drawbar consists of an I-beam casting pivoted at the rear end to the

ber of the chassis frame of the truck. This coupler is easily detached and transferred from truck to truck.

The steering mechanism is patented. This is controlled by the drawbar, to the lower surface of which is attached the steering fork socket and the steering plate pivoted at the center of the axle.



Two-Ton Trailmobile Fitted With Special Stake Body



Trailmobile Model L, Three and a Half Ton Capacity

draft beam in the frame by a hardened and ground bolt with a bushing. The pivot point is directly over the center of axle, which maintains a stable equilibrium.

The draw-head is a horizontal bell-shaped steel casting which is hinged to the drawbar and fitted with a double pin. In forward running both parts of the pin are inserted through the draw-head and the coupling bar. When backing the forward pin is removed. The shape of the draw-head and the special design of the coupling bar where it enters the draw-head enable the truck to back the Trailmobile from angular positions without prying against the side of the draw-head. The hinging of the draw-head provides for any difference in levels between the Trailmobile and the truck.

The coupling bar is a steel casting, which at the rear end fits into the draw-head and at the front forms a heavy cap which fits around the end of the bar. The housing is built up to contain the shock absorbing compression spring of special alloy steel. One pull rod is made of forged steel. It extends from the cap of the coupling bar through the compression spring. The pull rod is forged into an eye at its front to take the coupler on the truck and is free to revolve in its cage. A universal coupler is furnished to attach to the rear cross mem-

The steering plate is connected to the steering arms by cross rods which actuate the steering knuckles, and thus control the wheels, as in the lighter models of Trailmobiles. The horizontal movement of the drawbar caused in turning a corner is immediately communicated to the wheels through the steering fork, steering plate, cross rods and steering arms. Being hinged at both ends and with a plunger as an intermediary connection, the steering fork is free to move up and down with the frame and follow positively the action of the springs without affecting the alignment of the wheels.

The frame is made of standard steel channels. The ends are riveted to the sides and the corners are bound with heavy iron brackets outside and angle corner plates inside. Cross members consist of two heavy draft beams hot riveted to the side channels and one center cross member.

Block roller bearings are used on all axles. Springs are semi-elliptic. Each spring is fitted with rebound clips. Wheels are of artillery type, 14 spokes. The tires are pressed on solids made to S. A. E. standards. The hubs are of malleable iron of standard motor truck construction. All working parts are suitably bushed and lubricated.

Dimensions on Models K and L

Model K, 2-ton: Capacity, 4000 lb. (pay load); body allowance, 1000 lb. (additional); frame, 12 ft. long, 39 in. wide. Built of 4-in. channels; axles, 2 x 3¼ in.; springs, 50 in. long by 52½ in. wide; 9 plates; tires, 36 x 4 in.; wheelbase, 88 in.; width of track, 58 in.; weight, chassis only with drawbar, coupling bar and coupler, approximately 2000 lb. net.

Model L, 3½-ton: Capacity, 7000 lb. (pay load); body allowance, 1200 lb. (additional); frame, 12 ft. long; 39 in. wide. Built of 5-in. channels; axles, 2¼

x 37-16 in.; springs, 50 in. long, 3 in. wide, 10 plates; tires, 36 x 5 in.; wheelbase, 88 in.; width of track, 66½ in.; weight, chassis only with drawbar, coupling bar and coupler, approximately 2600 lb. net.

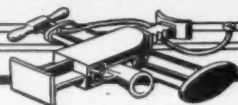
Lewis-Hall Iron Works, Detroit, Mich., announces that its production schedule for the coming year calls for an output of 1000 trucks. The company built 500 trucks for the Government and is now back on a peace basis. This company began to produce trucks in 1915, and that year made 100 3½-ton trucks. The next year the 2- and 5-ton worm drive models were introduced, and also the 5- and 7-ton chain drive trucks.

Weekes-Hoffman Co., Syracuse, N. Y., has completed plans for the production of gears for automobiles and tractors and will soon be turning out these products in quantity. W. H. Diefendorf has resigned as chief engineer of the New Process Gear Corp. to join the Weekes-Hoffman Co. in the capacity of vice-president and general manager. J. M. Weekes is president and A. J. Hoffman, secretary.

Parker Axle & Products Corp., New York City, which will manufacture the Parker silent internal gear axle, has elected officers as follows: Clark W. Parker, president; W. D. Collins, vice-president, and Wyman C. Parker, secretary and treasurer. The axle which this company will make has the internal gear enclosed and running in an oil bath. Raybestos disk brakes are located on the driving shaft.

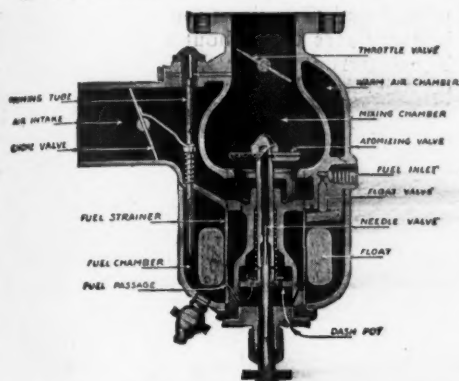
Jackson Screw Products Co. has been formed at Jackson, Mich., by Camiel Thorrez, Elmer Thayer and J. J. Best. The company will make small parts for the automotive industry.

TRUCK EQUIPMENT AND APPLIANCES



Knox Model F Carburetor

The latest addition to the Knox line of carburetors is the Model F. This line of carburetors is manufactured by the



The Knox Model F Kerosene Carburetor
This is an automatic multiple jet carburetor, with but one moving part

Camden Anchor-Rockland Machine Co., of Camden, Me.

The gas and air is automatically taken care of by the action of the floating atomizing valve, which operates automatically at all engine speeds.

The fuel from the bowl of the carburetor is passed up by the metering-needle into the hollow stem of the atomizing valve, and from there shoots out through twenty jets, where it is picked up by the inrushing air. The vacuum lifts the atomizing valve, which rides up and down on the metering needle, taking more or less gas as it moves up and down. Any back flow of fuel, caused by condensation, is passed back into the bowl of the carburetor. The lower end of the atomizing valve is made in the form of a piston working in a chamber carrying fuel, this acting as a dash pot and preventing the valve from clattering or pounding on its seat. The prices range from \$25 to \$50, for from 1-in. to 2-in. intake pipe.

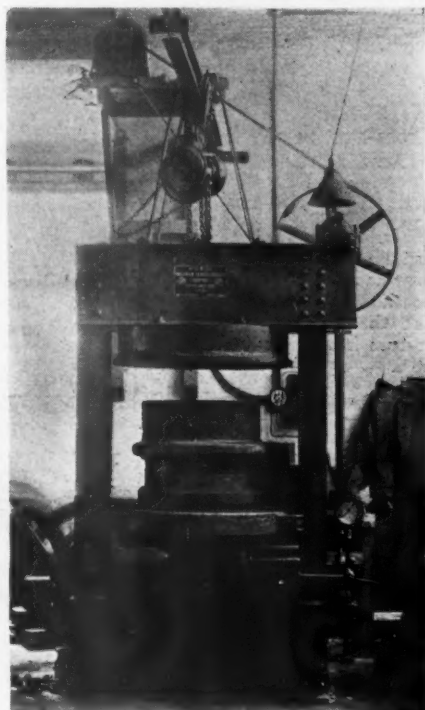
The W. S. M. Solid Tire Press

The success of the solid tire business hinges very largely on the ability of a dealer to give service. The general desire of owners to obtain the greatest possible mileage from their tires causes them to delay renewals until tires are worn close to the rims and replacements are imperative, so they demand quick service. Few truck owners want their truck laid up during productive working hours, so the dealer must be prepared in some instances to give night service. To sell solids successfully, therefore, a dealer must be equipped to rapidly apply tires.

A little over a year ago, a number of the tire companies put their problem up to The Wellman-Seaver-Morgan Company, of Akron, Ohio, which company's broad engineering knowledge and experience in the manufacture of heavy machinery enabled it to design a tire applying press, which has proven very satisfactory and has been adopted by a number of tire concerns.

Five hundred of these presses were built the first year and they are now leaving The Wellman-Seaver-Morgan Company's plant at the rate of thirty-five a week.

The speed qualities of this press are evidenced by the records made by some



W. S. M. One Hundred and Fifty Ton Solid Tire Press, Built for the Packard Automobile Company, of Cleveland, Ohio

of the dealers. For instance, there are records of removing front wheels, pressing off an old tire, installing a new tire, and remounting the wheel in seven minutes. The same work has been done with rear wheels and dual tires in forty-five minutes.

This company also maintains a service department, the purpose of which is to see that every press in the field is working properly. Careful record is kept of each press shipped and this is followed up at intervals for inspection. Dealers are instructed as to the proper method of running the press and given many

valuable suggestions as to the best method of applying and removing tires.

The press consists of an upper and lower platen held in a frame of I beams. The lower platen is moved by a ram working in a cylinder and actuated by a hydraulic pump. The press is equipped with pressure gauge, relief valve, control valve, and is driven from a shafting line or by a separate motor.

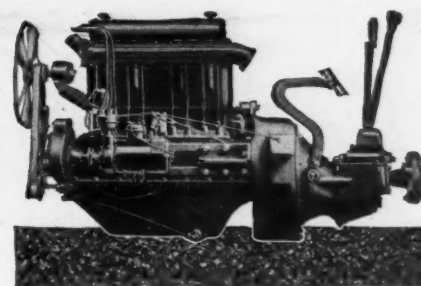
All presses are designed to mount and demount all sizes up to the largest solid tire built—42 x 14 in.

Matthews Model F Engine

The Matthews Engineering Co., of Sandusky, Ohio, is offering a Model F engine for use in cars, trucks and tractors and for general power purposes. It is a 4-cylinder, four-cycle engine with a 3½-in. bore and a 5-in. stroke, giving a total piston displacement of 192.4 cu. in. The S. A. E. rating is 19.6 hp.

This engine weighs 400 lb. At 1000 r.p.m. it develops 21 hp. and at 1500 r.p.m., 26.6 hp. It is of the overhead valve type and has cylinders cast in block integral with the upper half of the crankcase. The valves and rockers are enclosed and the cylinder head is detachable. The lower half of the crankcase is a steel stamping. It is made for three or four point support.

The cylinders are offset ¾-in. from the crankshaft. Both cylinders and pistons are cast of close grained gray iron and the pistons have three eccentric rings each. The crankshaft is drop-forged,



View of the Matthews Engine

This illustration shows the Matthews Model F engine for tractors and trucks

heat treated and ground. The connecting rods and camshaft are drop-forged of carbon steel; the former of forty point and the latter of twenty point. The main and crankpin bearings are bronze-backed, Fahrig metal lined. The camshaft bearings are bronze. The piston pin is secured by a locking pin and has its bearing in the connecting rod.

The valves are special alloy with steel heads, welded to carbon steel stems, and

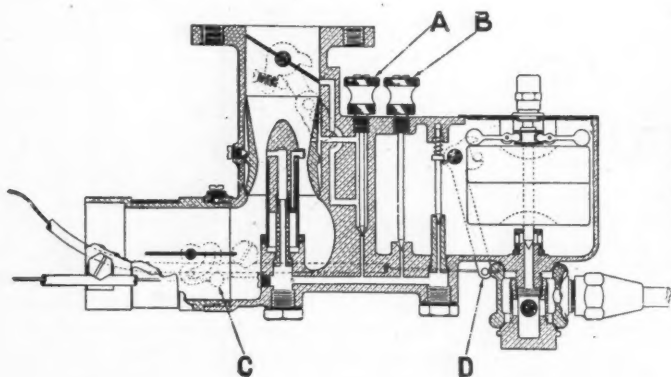
are 1 9-16 in. in diam. and lift 9-32 in. The lifters are mushroom type, offset. The lubrication is by gear pump, driven from the accessory shaft. The cooling is by thermo-syphon except in cases where a circulating pump may be necessary, in which case a bronze pump, of this type, is mounted on the left side and driven from the accessory shaft. The high tension magneto is also driven from the accessory shaft.

The Schebler Plain Tube Carburetor, Model A

The new plain tube carburetor of the Schebler line is built along the "Pitot" tube principle, utilizing the differential head created by an up-stream and down-stream Pitot to control the fuel delivery. The maker claims that this Pitot tube principle gives a fuel flow absolutely proportioned, and controlled by the air for acceleration. The maker is the Wheeler-Schebler Carburetor Co., Inc., of Indianapolis, Ind.

This carburetor has a low speed idling device, which delivers fuel and air at the lower edge of the throttle disk in its closed position. The carburetor has no small air vents to the outside air that might clog with dust or foreign substance, and in case of back-fire there is no chance of the gas blowing back to the outside of the carburetor and causing fire.

Two gasoline needle adjustments are provided, one for low and one for high speed, and these take care of weather conditions and the slight variations that occur in all engines. A starting shutter is placed in the air intake and a gasoline strainer is at the bottom of the bowl. A dash adjustment is provided for warming up the engine and compensates for the flow rate of cold fuel without restricting the air supply, thus furnishing



the additional gasoline required to warm a cold engine.

The new Model "A" Schebler is made in 1-, 1¼-, 1½-, 1¾-, 2- and 2½-in. vertical type, and in the 1-in. and 1¼-in. horizontal type, the latter being known as the Model "A-H."

The prices will probably be \$19.50 for the 1-in.; \$21 for 1¼-in., and \$22.50 for the 1½-in.

Splitdorf Offers Aero Magneto for Trucks

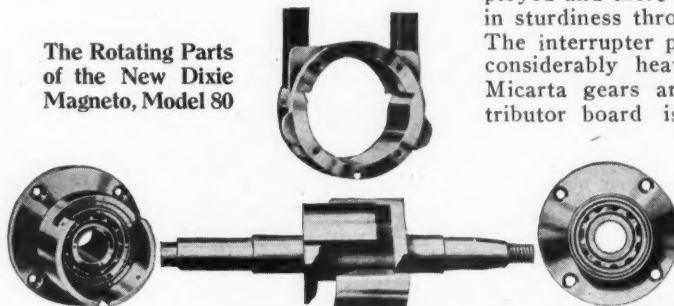
A new series of magnetos, known as the Aero Type, has just been announced by the Splitdorf Electrical Co., of Newark, N. J.

This instrument differs from conventional design in that it has a stationary winding. The revolving portion of the instrument consists of a shaft on which are two pieces (called wings) of magnetic material separated by a center piece of non-magnetic material. This shaft, instead of extending between the poles of

its core is extended to afford a path to the magnetic lines of force. The rotating poles are always of the same polarity, because they are in contact with given poles of the magnet. As they revolve they brush the field pieces, thus breaking the magnetic circuit and causing a current to be produced in the primary winding. The remainder of the operation of the induction of the secondary, etc., is conventional. The condenser is mounted directly above the winding, and like all interior parts, is accessible by removing two screws.

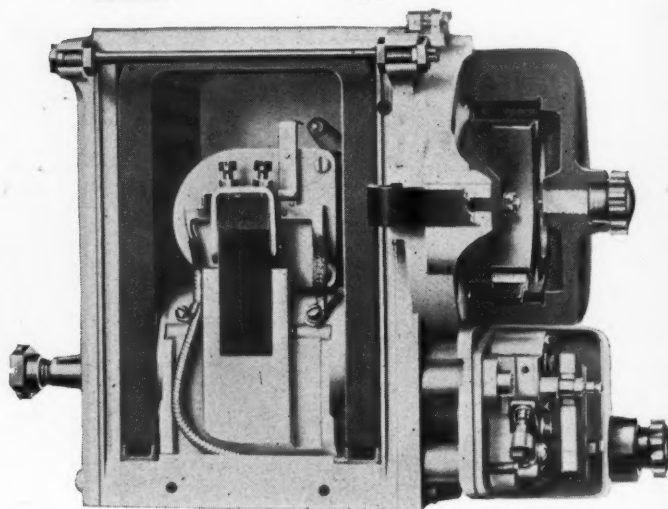
A single square carbon brush is employed and there is a noticeable increase in sturdiness throughout the instrument. The interrupter points, for instance, are considerably heavier than in the past. Micarta gears are used and the distributor board is composed of a new product from the Splitdorf laboratories, known as Americanite. The Mason principle of stationary windings

The Rotating Parts of the New Dixie Magneto, Model 80



Cross-Section of New Dixie Magneto

This illustration shows the winding and field armature and interrupter and distributor mechanism. Notice that the stationary armature is well protected.



and revolving field, the basic principle of the Dixie magneto, is retained in this new instrument.

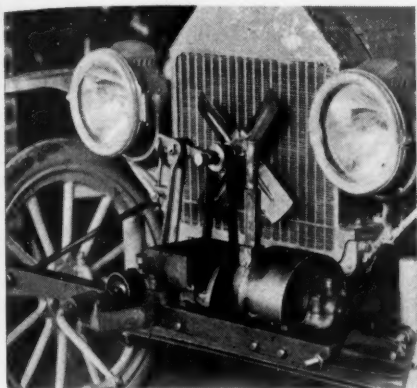
Some of the features claimed for this type of construction are: simplicity; fewer parts; complete protection to all parts; ease of adjustment even while magneto is operating; no wire or any revolving part; same spark intensity regardless of spark lever position.

Belt Power Attachment for Front of Ford Car

The Perfection Belt Power Attachment, illustrated herewith, attaches to the front of the Ford car and permits the owner of the Ford to use the power of the engine for operating grinders, machine shop lathes, drill presses, forges, etc.

This device is made entirely of steel and iron, and is simply constructed and substantially built. The bearings are of sturdy construction and equipped with oil cups. This attachment has a high grade lever feed friction clutch pulley, so that the power can be disconnected

from the work immediately and the engine allowed to run. It also permits slowly starting the work without throttling of the engine.



Perfection Belt Power Attachment

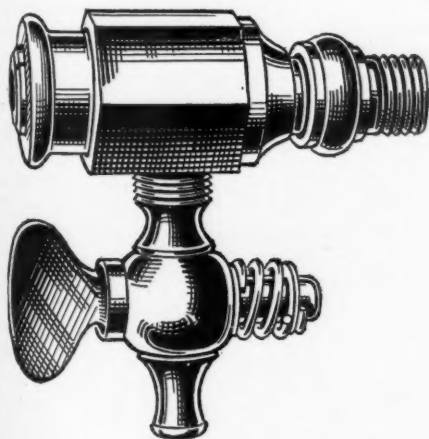
This device can be attached to the front of the Ford car and permits the use of the power of the Ford engine for operating machinery.

The fan shown is furnished with the outfit and supplies air that would ordinarily pass through the radiator while driving on the road. The complete outfit sells for \$45. It weighs 125 lb. It is manufactured by the Ashland Products Co., Ashland, Ohio.

Gas-Savo Fuel Economizer

The Gas-Savo device, a fuel economizer and device for loosening carbon and blowing it out of the engine, is being manufactured by the Gasoline Economy Co., 215 West 125th St., New York City. This device is made of solid brass. The air intake consists of an automatic air check valve, which can be set to open at any desired speed of the engine. The air is sprayed into the mixture in the intake manifold and, it is claimed, makes the mixture more completely combustible and reduces the formation of carbon.

The hose connection with valves is for use in removing carbon from the cylinder by running kerosene, or water or



The Gas-Savo Device

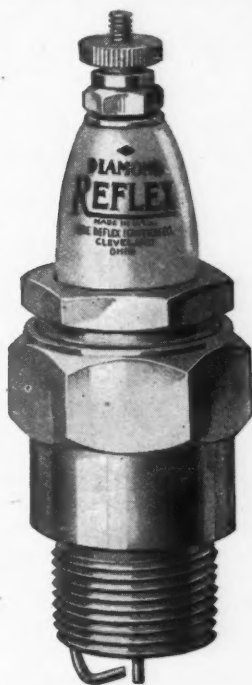
This device is attached to the intake manifold

any liquid carbon remover through the cylinders. Rubber hose is furnished with the device for this purpose. The price is \$6.

The Diamond Reflex Spark Plug

The Reflex Ignition Co., 1708 Payne Ave., Cleveland, Ohio, is manufacturing the Diamond Reflex Spark Plug. This is designed especially as a heavy service plug and is guaranteed to give good service. The points are unusually durable. This plug is made in special sizes for tractors.

Cromite Porcelain is used in all reflex plugs. This material is made of selected clays, ground to powder, dried and seasoned and then hand turned on a lathe to the size required. This plug has the petticoat type core. The electrodes are turned from a free cutting, screw steel



The Diamond Reflex

This is a large plug for service in heavy-duty engines and racing cars, and is made to meet the severe requirements of this work.

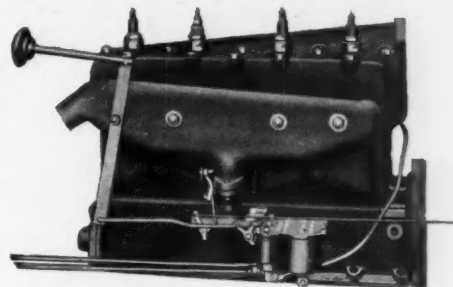
stock, and have a clean die-cut thread. The best nickel wire is used. Asbestos crimped gaskets are employed to secure compression tightness. A spring lock-washer allows for the contraction and expansion of the core and also holds the compression nut in position.

Frankfort Kerosene Carburetor Outfit for Fords

A complete outfit for operating a Ford car on kerosene, is being manufactured by the Frankfort Carburetor Co., Inc., Frankfort, Ind. The outfit consists of a combined exhaust and intake manifold and two complete carburetors, one for starting the engine on gasoline and the other for operating it on kerosene. This concern furnishes with the outfit a cylinder head gasket which gives the necessary extra space in the combustion chamber. It also furnishes stud bolts and a fuel tank for gasoline, with complete connections. The outfit sells at \$30. The Duplex manifold with elbow for con-

necting to other carburetors, sells for \$10.

The carburetor has one bowl for kerosene, one for gasoline and one for water, each controlled by its own mechanism and each a carburetor in itself. The ex-



The Frankfort Carburetor Installed

This illustration shows the Ford engine as it appears equipped with the Frankfort kerosene carburetor outfit.

haust in the manifold heats the entire intake manifold, greatly assisting in the vaporization of the poor grade of gasoline or kerosene, as it is used. Dash control of the fuels and water supply are provided.

Stanweld No. 76 Rim

The Standard Parts Company is now offering to the trade its new standardized demountable rim, known as the Stanweld No. 76 Rim. This new rim retains all of the features of the No. 21 rim, and in addition has the advantage of interchangeability with other makes, as it conforms to the recently adopted rim standards.

The cam locking device, which has long been a popular feature in Stanweld rims, is retained unchanged. The valve stem is placed safely away from the split, preventing injury to the stem as the rim is manipulated. Wedge nuts are self-contained, a feature which simplifies the removal or application of a rim and prevents nuts from being misplaced or lost. Wedges of the 76 rim have large bearing surfaces, tending to insure a true



The New Stanweld Rim

alignment of the rim upon the wheel and also to eliminate "squeaking."

The 76 rim is offered in all standard sizes ranging from 30 x 3½ to 40 x 8.

The Detroit One-Piece Hose Clamp

A new hose clamp is being manufactured by the Detroit Automatic Clamp Co., 139 Beaubien St., Detroit, Mich. It is made in one piece and will not cut the



The Detroit Hose Clamp

hose nor cause it to buckle. The head of the clamp is thoroughly reinforced, resulting in unusual strength. This clamp is made with rust-proof finish. A special box of hose clamps, 100 in each box, sells for \$7.50. It is composed of an assortment of the correct sizes for practically any car.

Holley Introduces All-Fuel Carburetor for Cars, Trucks and Tractors

The Holley Carburetor Co., of Detroit, Mich., is manufacturing its new All-Fuel Carburetor, designed for use with kerosene, distillate, gasoline, benzol, or any mixture of these heavy fuels. Provision is made for starting the engine on gasoline. It is stated that, with one minute's running, the gasoline can be shut off and the kerosene turned on by a single valve controlled at the dash.

The distinguishing feature is the thor-

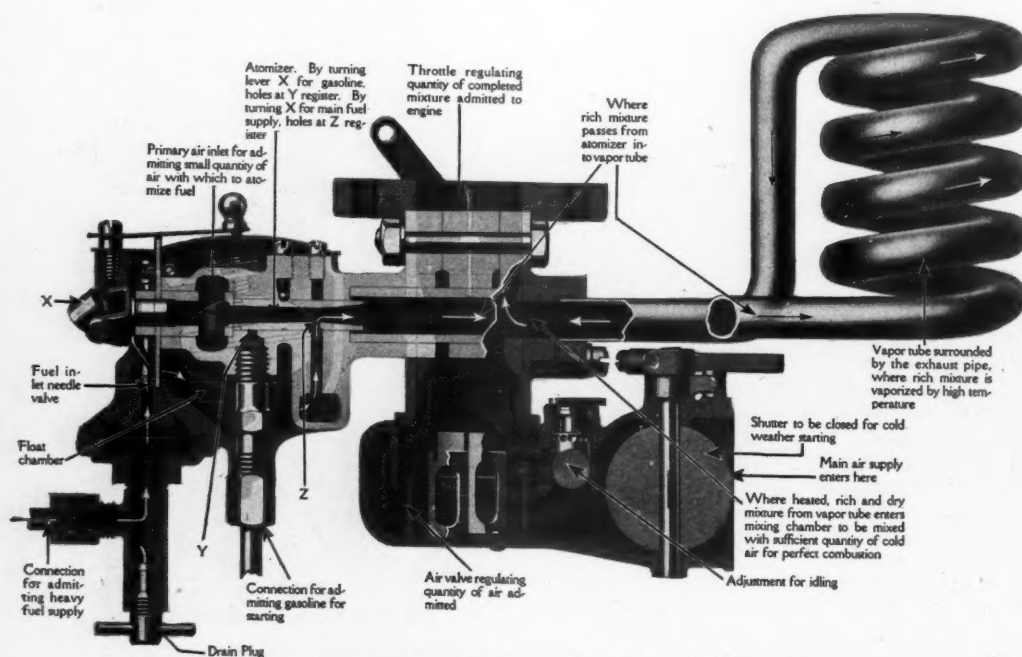
ough vaporization without excessive heating of the mixture. The fuel is first changed to a gas and then mixed with cold air. After passing the metering jet, the fuel, together with a small amount of air, is drawn through the vaporizing tube, which is heated by the exhaust. This gas, after being heated, is introduced at the throat of the venturi, and enters the air stream at high velocity.

At one end of the exhaust manifold is a heater pot surrounding the vapor tube, through which the fuel circulates. The exhaust heats the walls of the vapor tube enough to vaporize any of the fuels mentioned.

Another feature of this carburetor is the atomizer, a tube carrying air through its center and containing a series of jets arranged to be rotated into register with either the starting fuel or the fuel in the fuel chamber. This provides at the same time a means for shifting from the starting fuel, and a range of adjustment by jets of fixed size which prevents the operator from getting an improper working mixture. The jets can be easily taken out and cleaned.

The main air supply is controlled by the air valve, which regulates the amount of air and also the fuel drawn through the vapor tube and atomizer. The air for idling is drawn past the valve, which does not open until the engine speed increases. An idling adjustment is provided.

This carburetor has been conveniently constructed. The parts are simple and accessible. For instance, by swinging aside the fuel bowl cover, the float is exposed and the fuel level can be checked up by a rib cast on the inside of the bowl. The parts can readily be removed for cleaning or replacing. A strainer with a drain plug protects the mechanism from dirt and there is another drain plug in the bottom of the fuel bowl.

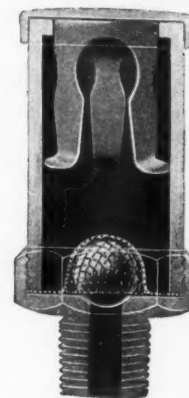


Sectional View of the Holley All-Fuel Carburetor

This new product of the Holley Company will use kerosene, distillate, gasoline, benzol or any mixture of them, and is started on gasoline

Dann Jiggle Cups

The Autoware Corp., 121 State St., Detroit, Mich., is producing the Dann Jiggle Cups, for furnishing oil to bearings only when the car is in operation. The cups are simple and economical in design and can be used on passenger cars, trucks or tractors. The caps can be quickly removed by pressure upon the clips, shown in the accompanying illustration, and oil holes between these three clips permit the cup to be filled from any side. A fine mesh screen is located at the base and extends over the ball valve, this screen being to strain the oil. The screen is claimed to be self-cleaning, due to the movement of the oil back and forth over



A Sectional View of the Oil Cup

This illustration shows the ball valve and the screen over it which prevents the entrance of any dirt to the parts to be lubricated.

it, and the pockets, at the base, catch and hold any dirt or sediment. The bottom of the cup may be unscrewed to clean out the dirt as occasion may demand.

Dural Brake Lining and Inner Tubes

The Dural Rubber Corp., of Flemington, N. J., is manufacturing a woven asbestos friction fabric brake lining. This concern has had years of experience and research and claims to have eliminated any possible weak points in the manufacture of such a product.

Dural tubes are hand made. They are known as the Antimony Red Dural Tubes. They have laminated construction, from sheeted rubber rolled from 3 to 5 ply, and there is a liberal overlap which gives protection against bead or flap pinching. The splices are joined by a steam pressure process which seals them permanently. They are guaranteed by the maker not to leak. The valve stems are embedded in pure rubber, reinforced with Sea Island Duck, steam cured.

Blackmer Rotary Pump Co., Detroit, Mich., announces the opening of a new district office at 1119 Real Estate Trust Bldg., Philadelphia. J. Frank Smith is in charge of this office.

A Neat Device for Handling Lubricating Oil

The "Perfect Service" Liquid Measure is a combined measure, funnel and strainer, especially adapted for the handling of lubricating oil.

This device has a flexible nozzle which does away with the use of a funnel and makes it easy to put oil in inaccessible places. It has a valve in the bottom to control the flow of oil through the nozzle, the valve being operated by a thumb



The Perfect Service Liquid Measure
With the flexible nozzle it is unnecessary to use a funnel

lever located just above the handle. These measures are made in two sizes, one-gallon and one-half gallon. The gallon size is provided with a hinged cover to keep dust or foreign matter out. When not in use, the nozzle is held upright by a clamp near the top of the measure, as shown in the illustration. The price of the half-gallon can, in tin, lists at \$3, and in copper, \$3.50. Made by Frank Carroll & Co., of San Antonio, Texas.

Thermostat Controls Fuel Used in Henner Coal Oil Carburetion System

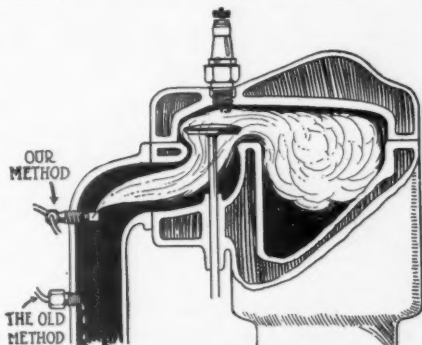
The Henner Automatic Oil Carburetor Co., Inc., 1000 East Main St., Rochester, N. Y., is manufacturing the Henner automatic system for Ford cars to allow the use of coal oil as fuel. This system consists of the following: Special mani-

fold, complete, with heat regulation tube and thermostat; automatic valve and water metering attachment; a complete kerosene carburetor with hot tube fittings and hot air connections; the necessary throttle connections; small gasoline tank; small water tank and copper tubing, and the necessary studs for bolting the manifold to the engine. The price complete, f.o.b. Rochester, is \$55.

This system has no sensitive adjustments and requires no attention. The car can be started and operated on gasoline, but upon reaching a temperature sufficient to vaporize kerosene, the thermostat embodied in the system automatically operates a two-way valve and connects the kerosene carburetor to the engine, shutting off the gasoline at the same time. This automatic operation eliminates any adjustments and levers which would otherwise be necessary.

The Jorgensen Vapor Primer

A new primer has recently been put on the market by the Jorgensen Manufacturing Co., of Waupaca, Wis. Its use enables the driver of the car to force a spray of gasoline into the manifold toward the inlet valve. This device is furnished complete with connections for the manifold, plunger, piping and connections for tapping the gasoline line. A stroke of the pump sprays gasoline into



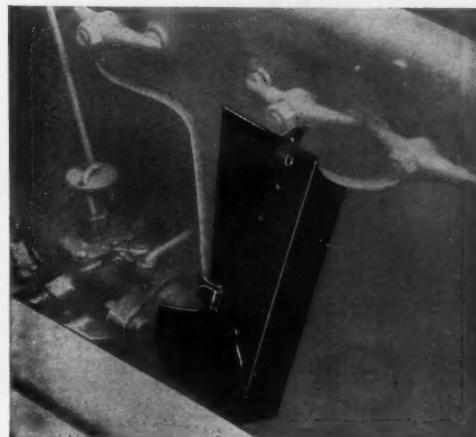
The Jorgensen Vapor Primer

This device sprays the fuel up into the manifold, where it is drawn into the engine

the manifold, breaking it up and forcing it toward the intake valve, thus greatly facilitating the starting of a cold engine. The pump itself is made in the slanting and straight styles and is well finished. This device, nickel-plated, sells for \$5.

Device to Heat Manifold and a Coil Protector

The Major Coil Protector Co., 366 Vinewood Ave., Detroit, Mich., has recently taken up the manufacture of the Quick-Start Manifold Pre-Heater. This is a device for Ford cars which is attached to the intake manifold. It is equipped with a small alcohol burner and the use of this, when the engine is cold and gasoline does not readily vaporize, will

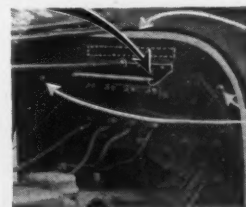


The Manifold Pre-Heater in Position

heat the manifold to a degree which will enable the driver to start the engine with little trouble. The alcohol can be lighted with a match struck on the screen within the heater, away from the wind. The bottom of this device is equipped with a screen, the same as used on miners' lamps. Its price is \$1.75.

The Major Coil Protector

This device is made of stamped steel and is fitted with a felt gasket to conform to the dashboard, in case it is uneven, and an extra felt gasket is supplied for use between the dashboard and body to keep rain from the inside of the coil box terminals, as the sloping dash of the Ford car allows water to run down beneath the hood, and difficulty in starting



The Major Coil Protector

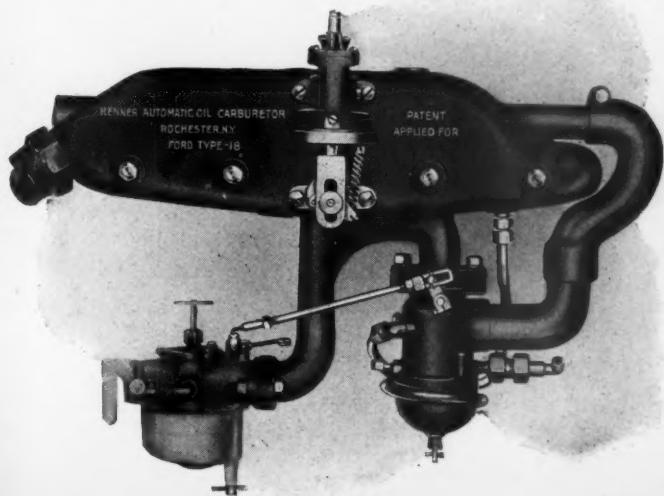
A device which prevents rain from reaching the coil and connections.

is experienced. The protector itself prevents the coil terminals from becoming wet. This device retails for \$.65 post-paid, which price includes the extra felt gasket and four screws to fasten to dash.

A New Rim Tool

The Duplex Rim Device is manufactured by the Duplex Rim Device Co., 7546 S. Chicago Ave., Chicago, Ill. It will fold up into little space when not in use and at the same time gives great leverage when attached to the rim to break the joint.

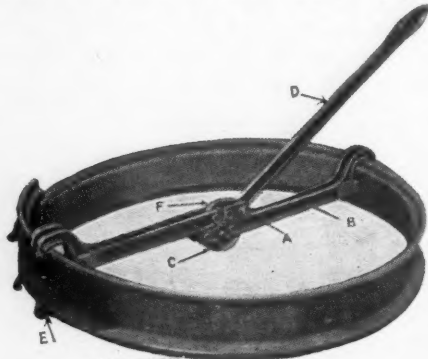
This tool can be used on any size rim, either straight side or clincher, and the



The Henner Kerosene System

This is a fully automatic system of coal-oil carburetion for the Ford car. The device utilizes a thermostat in switching from the gasoline carburetor to the coal-oil carburetor supplied with this system.

maker states it will unlock or lock any rim without injury to the same or to the tire. Provision is made to pull equally



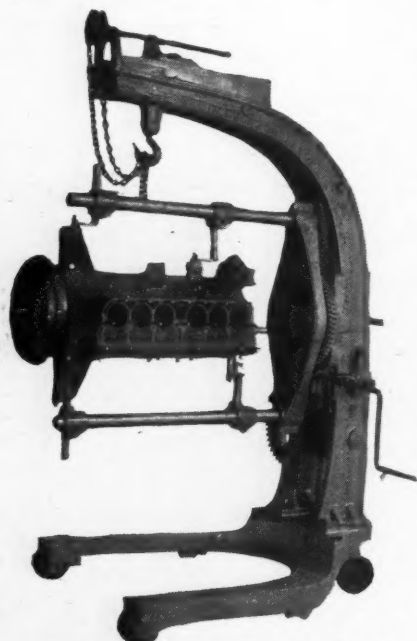
The Duplex Rim Device

This is a new tool which greatly reduces the labor in changing tires

on both sides of the rim, which is a feature to be considered, and one most useful when the tire has not been removed for some time and may, therefore, be rusted on the rim.

The Canton Combined Crane, Hoist and Engine Stand

A recent addition to the line of shop equipment of the Canton Foundry and Machine Co., Canton, O., is a neat combination of its portable floor crane and hoist and a special type of engine stand, for the quick and economical handling of engines. This outfit is portable, a special feature, in that the engine can be taken out of the chassis, hooked on the stand and taken to any part of the shop. The engine can be revolved so that any part is accessible.



Canton Crane and Engine Stand

This outfit is portable, and can be moved to any part of the shop

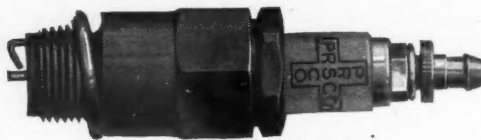
This apparatus has a capacity of two tons and a clearance or lift of 6 ft. 4 in. The crane is equipped with Hyatt roller bearings.

The Prsco Spark Plug

The Pennsylvania Rubber & Supply Co., of Cleveland, Ohio, is manufacturing in large quantities the Prsco Spark Plug. The plug is durable and made for strenuous use on passenger cars or trucks. The shell is extra large, of heavy blued steel. The porcelain is unusually strong and is made of Cornish Kaelin mixtures, hardened to great strength at a temperature of 2600 deg.

The firing points are of meteor wire, a tough, non-fusible metal alloy of steel, iron, copper and iridium.

The plugs are made in all sizes and are guaranteed. They can also be furnished with a mica insulation if desired.



The Prsco Spark Plug

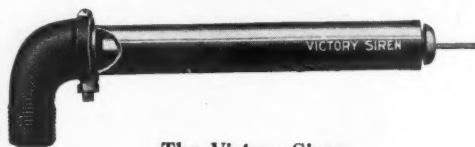
This is a plug built for endurance and designed for strenuous use

Heavy copper-covered asbestos gaskets are used to cushion the porcelain itself. Each electrode is made in one piece.

A Prsco plug for tractors is also being made, with either mica or porcelain insulators. It is supplied in 1/2-in. and 3/4-in. pipe size.

The Victory Siren Warning Signal

A new warning signal, known as the Victory Siren, is being manufactured by



The Victory Siren

This warning signal is made for all cars and trucks and is attached quickly

the Inter-State Tool & Mfg. Co., 3419 Rutger St., St. Louis, Mo. It fits any truck and is quickly attached. The selling price is \$2.50.

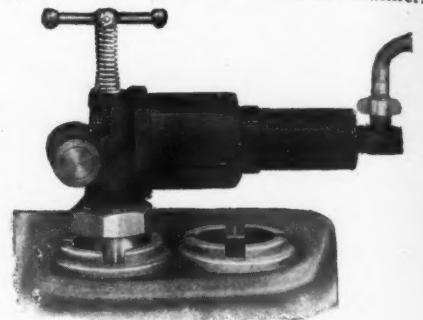
The signal has a pleasant tone with a range of two full octaves. This signal is said to be unusually dependable and it cannot balk or clog in any way. It is attractively finished in polished brass. It does not cause any back pressure and requires no attention after it is attached.

The Mayo Valve Cap Pump

A new tire pump which can be permanently attached to the engine and will deliver fresh air to the tires, is being manufactured by the Mayo-Skinner Mfg. Co., of 2115 Elston Ave., Chicago, Ill. It is so designed that the hose can be removed from the pump and stored in the tool box, the pump remaining on the engine.

This pump is fitted with a poppet valve, which, it is claimed, will not leak while the pump is not in operation. This pump is generally attached to a valve

cap of the engine, but when attachment in this manner is inconvenient, it can be applied in any other suitable manner.



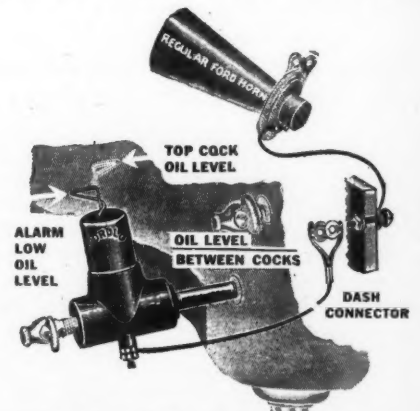
The Pump Attached to Engine

This pump delivers fresh air to the tires and will pump up to 150 pounds

The pump requires no attention other than a few drops of oil occasionally. It is non-adjustable and is noiseless in operation. The outfit includes 14 ft. of hose and an accurate gauge, with all necessary connections. The price is \$15.

The Fordlo Oil Alarm and Indicator

One of the new accessories in the line of the Gray-Heath Co., 1440 Michigan Ave., Chicago, Ill., is an oil alarm and oil indicator for use on the Ford car. This device will show the level of the oil in the crankcase, whether it is at a level with the top pet cock, the lower pet cock or at a level between them. The body of the device, which is screwed in through the crankcase, contains an electrical contact maker which blows the horn when the oil drops to a dangerous point. Wire connections for the horn are supplied. The indicator points to the front when the level is up to the top pet cock and to the rear when the level is



The Gray-Heath Low Oil Alarm

This is a low oil alarm and an oil gauge indicator for Ford cars, which will blow the horn when the oil drops to a dangerous point.

to the lower pet cock, and to the right side of the car when the oil level is between these two. The retail price complete is \$2.

Abbott-Downing Co., Concord, N. H., which plans to manufacture special automobile and truck bodies on a large scale, has elected Marcel Theriault, president, succeeding E. E. Vreeland, who retires. Josiah E. Fernald remains as treasurer.

The Cotta Company Brings Out Four-Speed Transmission

THE Cotta Transmission Company, Rockford, Ill., is introducing a new four-speed transmission in which gears are constantly in mesh and with which it is possible to make speed changes without shifting gears, due to the fact that jaw clutches are shifted instead of the gears themselves.

The new model is built along similar lines and operates on identically the same principle as the three-speed Cotta transmissions, which have been used in over 20,000 trucks, on the various fronts during the world war.

The four-speed Cotta transmission possesses exceptional gear ratios, and

which are mounted on roller bearings, is a set of jaw clutches. On the driven shaft are two corresponding double sliding clutches, by means of which any one of the speed change gears may be locked to the shaft. No matter how fast the car may be traveling, and regardless of the speed at which the gears may be rotating, the speed changes can be made instantly and with perfect ease.

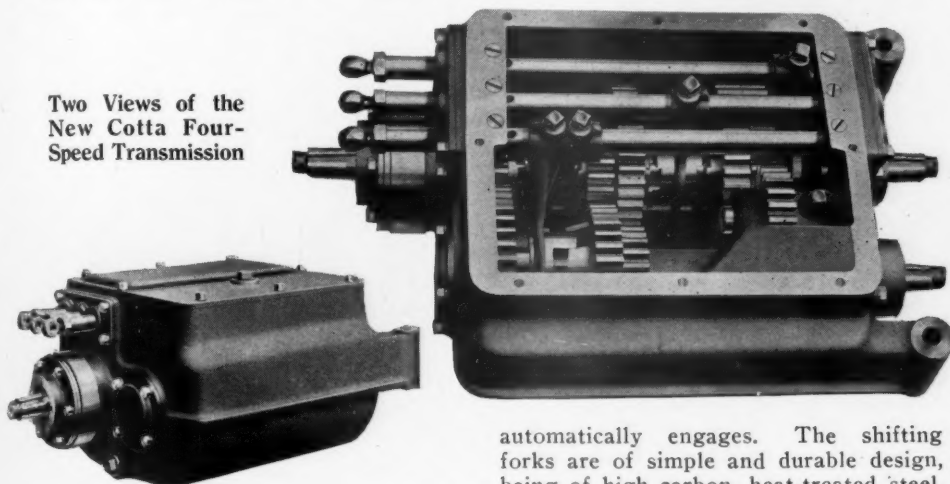
On high speed the driving and driven shafts are locked together and the clutch on the countershaft disengaged. The drive is then direct and the countershaft and all mainshaft gears, idle. When the sliding clutch is returned from direct to neutral position, the countershaft clutch

turers have equipped the spacing collar with peripheral spiral thread of a lead in a different direction from that on the clutch element, adapted to work the oil inward when reverse speed is engaged.

The double-step faces on the jaw clutches insure quick and easy engagement without strain on the teeth. The result is that the jaw clutches slide into mesh, six faces-meshing instantly.

Upon shifting any rod lengthwise, the other two rods will be automatically and positively locked against shifting movement until the shifted rod is returned to its original position. Locking balls or members are of such size and so arranged that upon shifting a rod lengthwise, for example, the ball will be forced out of its notch into engagement with its complemental locking ball and confined against movement in the opening between the periphery of the rod and the complemental ball, so that this rod will be positively locked against lengthwise shifting movement.

Two Views of the New Cotta Four-Speed Transmission



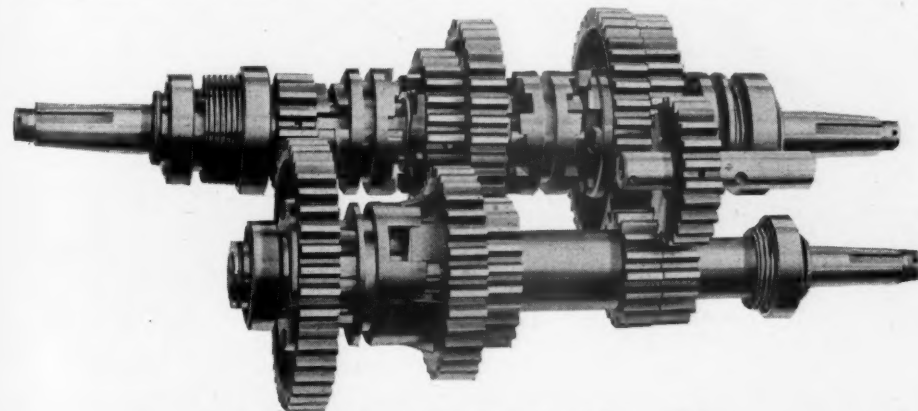
the transmission comes more nearly approaching ideal gear reductions for different speeds. The low or first speed is 5.2 to 1; second speed, 3.68 to 1; third speed, 1.86 to 1; direct or fourth speed, 1 to 1; reverse 4.66 to 1.

The gear reduction in second is low enough to start on under favorable conditions and the low speed of 5.2 when conditions are exceptionally bad, is the proper speed for crawling or where excessively heavy loads are handled over bad, rough, muddy, sandy or soft places.

Chrome nickel steel of the finest quality is used throughout the transmission. On the face of the speed change gears,

automatically engages. The shifting forks are of simple and durable design, being of high carbon, heat-treated steel, reducing wear to a minimum. The transmission is provided with a locking device, which prevents the engagements of two speeds at the same time.

Still another feature of the four-speed Cotta transmission is the provision for the working oil or lubricant in the casing away from the stuffing box of the driven shaft. This is achieved by means of a left-hand spiral thread which prevents the oil from crowding and leaking through when the driving shaft is in operation. When, however, direction of drive is reversed, the right-hand thread will have a tendency to work the oil outward, and to obviate this the manufac-



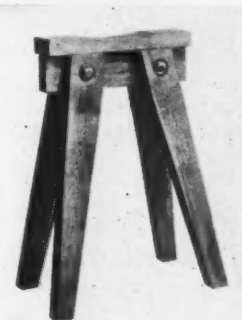
Gear Layout of the Cotta Four-Speed Transmission

This view shows clearly the dog clutches and the double-step faces which insure easy engagement

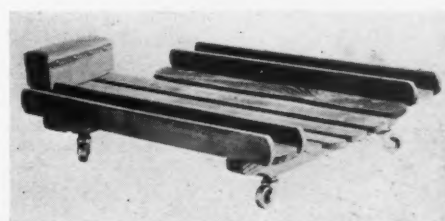
The Springville Tire Saving Jacks and Creepers

The Springville Wood Specialty Co., of Springville, N. Y., is manufacturing tire saving jacks and creepers of selected hard wood, substantially made. The tire saving jacks are strong enough for trucks, yet light in weight. They have a stained

The Front Piece is Made Slightly Concave, so That the Truck Cannot Work Off the Jack.



This Creeper is of Hard Wood and Substantially Made.

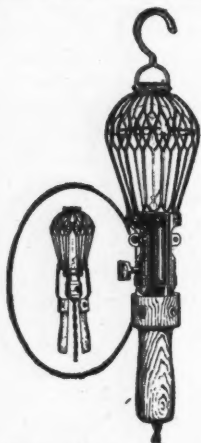


finish and the front piece is made slightly concave so that the car cannot work off the jack. These jacks can be readily knocked down or set up as there are only two bolts to insert. This feature makes them convenient to carry with the car for emergency road work. The price is \$2.50 f.o.b.

The creepers are substantially screwed together and are stained a rich brown. The tool trays are 4 in. by 1½ in. The slats are 2 in. x ½ in. and the bed pieces are 1½ x 2 in. The castor equipment of this device is the No. 7 Universal castor, which has a 1½-in. roller. The head rest is upholstered in brown imitation leather and well padded. The price of these creepers is \$2.50 f.o.b.

The Flexco Split Handle for Lamp Guards

A new design in portable lamp guards is shown in the accompanying illustration. It is the Flexco split handle, which



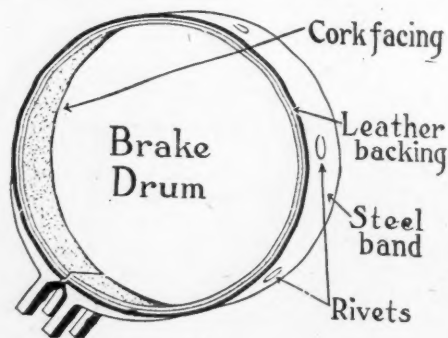
The Split Halves of This Handle Can be Quickly Locked Around the Socket of Any Extension Cord.

can quickly be attached to the Flexco expanded lamp guard, made by the same concern, the Flexible Steel Lacing Co., of 522 S. Clinton St., Chicago. The halves of this split handle open wide from the hinge at the bottom and can instantly be closed and locked around the socket at the end of any extension cord. The cord itself is run through the grooves of the handle.

This product should be useful in garages and repair shops. It permits the light to be carried safely to dark corners without danger of breaking the lamp or causing fire.

Hipco Fan-Belt and Transmission Brake Lining

The Hipco Mfg. Co., 34 Columbus Ave., Boston, Mass., is offering a leather and cork combination fan belt, which is said to have unusual gripping power and to be oil and element proof. The belt is guaranteed to give good service and grip even if the adjustment is loose.



The Hipco Brake Lining

The Hipco transmission brake linings, made by the same company, are leather with a cork friction face, the leather backing being next to the steel band. This lining is manufactured with a highly compressed cork friction face. The price of the band, complete with rivets, is \$2.

Cabinet for Small Parts

Dealers who have been having trouble in taking care of a vast number of parts and supplies, should find use for Heller's Sectional Cabinets.

The illustration shows Combination No. 281, consisting of a No. 254 base cabinet containing 20 Heller's patent steel boxes, 12 x 4½ x 24 in.; one unit section, No. 221, containing 60 Heller's patent steel boxes, 4 x 3 x 12 in.; one unit section, No. 210, containing 112 Heller's patent steel drawers, 3 x 2 x 12 in., and one unit top, No. 201.



Combination No. 281 is Fitted With Steel Boxes and Drawers for the Handling of Small Parts.

These goods are manufactured by W. C. Heller & Co., Montpelier, O., which concern publishes catalog 35-D, showing 85 different varieties of cabinets.

The Archer Hoist and Dumping Body

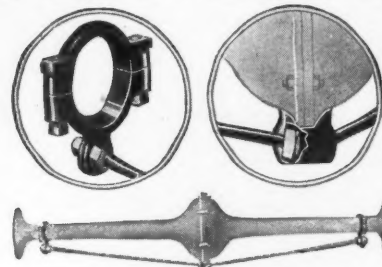
The Archer Iron Works, of Western Ave. and 34th Place, Chicago, Ill., is manufacturing bodies of various styles and capacities equipped with hoists for

commercial cars. The hoisting equipment is hand operated. The power is transmitted to the lifting ram by sprocket and chain, and through gears to the rack or chain on the ram itself. The turning of a crank lifts the ram of the hoist, raising the body by means of a cable, which runs over the sheaves on the ram and is fastened to the lifting angles on the body itself. The body moves twice as fast as the ram.

These bodies can be raised to an angle of 45 degrees in from 30 seconds to 2½ minutes time, depending upon the size of the hoist. The body is returned to position by gravity in 5 to 10 seconds and is controlled in its descent by a hand brake. A pawl and ratchet permits the operator to hold the body in any position.

Apco Rear Axle Truss

The Apco truss forms a support under the rear axle housing of the Ford car to carry part of the strain of any overload which may be placed upon the Ford axle. This truss is made of drop-forged rods, ½ in. in diam. with flush bolt heads, rivet recesses, half-round malleable clamps and a self-aligning cradle.



The Apco Rear Axle Truss

These illustrations show the rear axle truss installed, also an enlarged view of an end and the center portion.

It is finished in black enamel and packed in a heavy box. The truss is 26 in. long and weighs 6 lb. It retails for \$3 and is manufactured by The Apco Mfg. Co., Inc., of Providence, R. I.



The Archer Hoist and Body on a GMC Truck

Device Shuts Off Ignition When Oil Gets Low

A device which connects where the lower pet cock is attached to the Ford crankcase and known as the Watch Dog Electric Oil Gauge, is being manufactured by the Auto-Lite Switch Co., Mon-



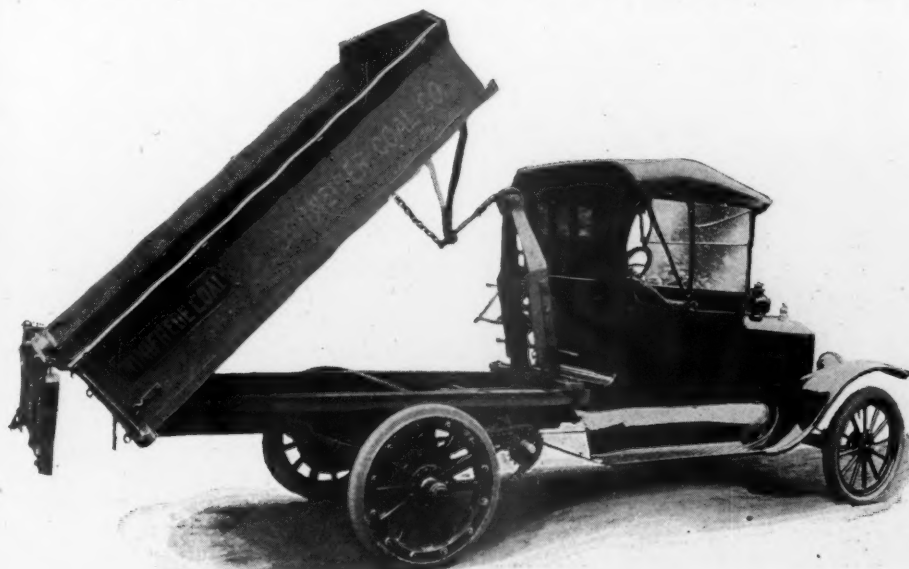
The Principal Function of This Gauge is to Shut Off the Ignition Current When the Oil Gets Low

roe, Mich. This device acts as an oil gauge, so that one may readily see the oil level, but its principal function is to shut off the ignition current when the oil gets low in the Ford engine.

This device has a wire for connecting to the magneto post, so that when the float, within the gauge, drops to the danger point, a connection is made which grounds the ignition current and the engine will then stop. The gauge sells for \$1.50.

Bruder Truck Bodies

The Bruder line of commercial bodies is manufactured by Lawrence Bruder, 211 West Second St., Cincinnati, O., and includes practically every known style of commercial body. Popular among the styles is the "Easydump Body," which is equipped with a hand-operated hoist, de-



Bruder Body and Hoist on Truck Attachment

signed by the maker. This hoisting apparatus is simple, practical and durable, and is made in various capacities, from 1 to 5 tons. The gears are so arranged that a 5-ton load can be dumped, with little effort, in less than three minutes' time.

Two styles of dump bodies are made. The Type B can be unloaded from the rear only, and the Type A can be unloaded from the rear, as well as from either side. The latter type is especially adaptable for unloading in close quarters, for road grading, etc. Both types are made of wood or steel, or wood with steel bottoms. Thoroughly seasoned hardwood lumber is used in their construction and the steel is hand forged.

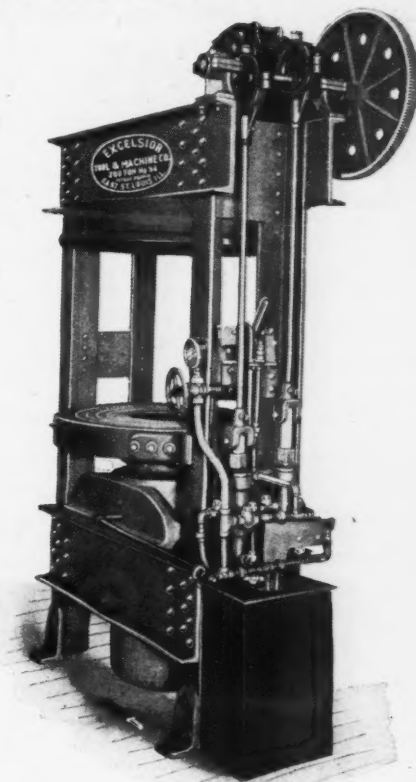
Excelsior Two Hundred Ton Tire Press

The Excelsior Tool and Machine Co., of East St. Louis, Ill., is calling attention to its Tire Applying Press, No. 34, which will exert a working pressure up to 225 tons. This tire press is factory tested to work up to this pressure, with the safety valve set to release the pressure at 200 tons, while any desired pressure up to this capacity can be obtained by means of the regulating valve, with the gauge in full view of the operator. When this valve is open, the plunger will retard, whether the pumps are operating or stopped.

The platens are 44 x 8 in. in diameter, and have openings of 8 and 24 in. Distance between platens is 36 in. The height of the press over pulley is 10 ft. 6 in., while the width inside frame is 24 in.

The pump consists of two high and two low pressure units. The low pressure units are automatically released by a special automatic release valve, located behind a gauge. As soon as the pressure is above 5 tons this valve opens automatically and it can again be brought into action by raising the lever after the pressure is reduced. This construction

prevents any possibility of the automatic arrangements not working properly and simplifies the construction so that anyone can understand the principle of the press. The press can be operated either by direct motor drive or it can be connected to a line shaft by belt.



Excelsior Tire Press

The manufacturers call particular attention to the sturdy construction of this press and to the quality of materials used. The frame is structural steel, consisting of four 6 x 6 x 5/8-in. angles, hot riveted to four 15 x 3/4-in. channels, and reinforced by eight additional angles and steel plates.

The cylinders, ram, platens and pump castings are made of special semi-steel. The valves are phosphor bronze, and are easily reground and replaced. The pump plungers are forged steel and are packed with a high grade packing material.

This press requires a 2-hp. motor at approximately 1750 r.p.m. to run it.

For belt drive, a 30 x 5 1/2-in. pulley is furnished unless otherwise specified. The machine is furnished complete with either one tight pulley or tight and loose pulleys for belt drive, or the motor bracket and gear for direct drive.

Ellis-Smith Mfg. Co., Inc., Elmira, N. Y., announces that it is now operating its own foundry and building its merchandise from the raw material. This company makes a combination jack, which can be used as a garage jack and turntable or as a towing truck. The company is desirous of making connections with manufacturer's agents in every state.

Big Packing and Provision Business Saved by Motor Trucks

Successful Operation Under Most Adverse Conditions Prove Their Dependability. Better Service Triples Sales. Delivery Conditions Revolutionized. Serve Buying Population of One and a Quarter Million

YEARS ago the Pittsburgh Provision and Packing Co. sent a large part of its shipments to various towns by boats which navigated the Allegheny, Monongahela and Ohio rivers. Then the demand for quicker service and the increased efficiency of the railroads caused a change to this medium of transportation. Recently the increased freight hauling, due to the war, made it almost impossible for a shipment to be made within a radius of 100 miles.

Trucks Permit Business to Continue

The failure of the railroads meant that the company had to find a substitute or go out of business. Then it was that the sales manager, John J. McAleese, suggested the use of motor trucks. He really believed in the practicability of the proposition, but no one else did. Mr. Ogden, the general manager, supported the plan because there was no alternative. All the towns within a 75-mile radius of Pittsburgh would have to be reached, and the condition of many of the roads was such as to make the successful use of trucks a dubious proposition. However, a fleet of twenty-two trucks is now in service, and the record of their performance speaks for itself.

Saving Effected by Truck Delivery

Even in normal times the railroads are but inefficient carriers of the perishable stuff the company deals in. The trucks have replaced the express service for good.

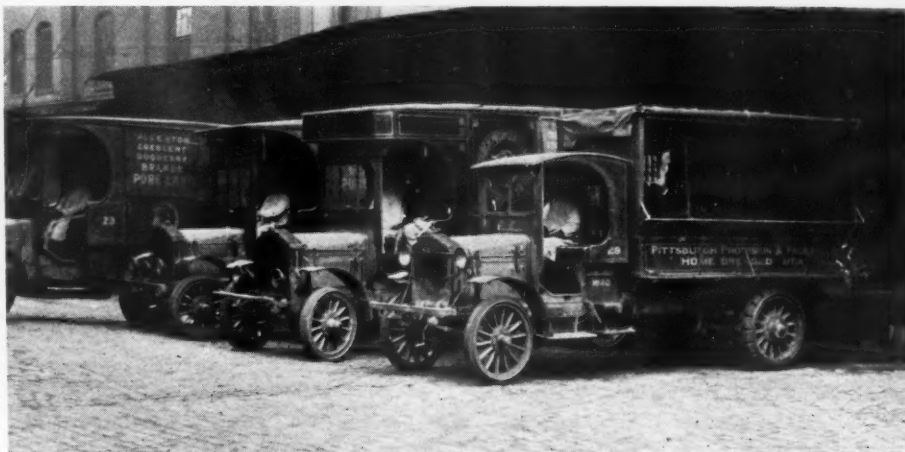
When shipping by express the meats must be burlaped or boxed to protect

them from damage or contamination through contact with other matter in the same car, and also against dirt in loading and unloading. With the trucks this is eliminated. A truck carries nothing but meats and is lined with clean paper, so that it is not necessary to wrap the orders at all. The saving, as a result of this item alone, presents a considerable argument in favor of the truck.

For example: A 5-ton truck carries, say, 12 sides of beef, 10 sides of lamb,

shipment by express would be \$16.50. Boxes range from 23 to 27 cents each, so that the cost of the boxing would be about \$10. This makes a saving of \$26.50 on each 5-ton truck load. This does not include the cost of the labor engaged in burlaping and boxing. One of the men in charge of this work estimates total cost of burlaping a single side at \$2.25.

Damages and reclamation, due to faulty handling by the express companies, eats up profits even in normal times.



Four of the Pittsburgh Provision and Packing Company's Fleet of Twenty-two Trucks

and 8 sides of pork, together with enough small portions, such as shoulders, loins, neck, etc., to represent 40 boxes if sent by express. Each side must be burlaped. A burlap covering is 55 cents, and the cost of preparing the 30 sides for

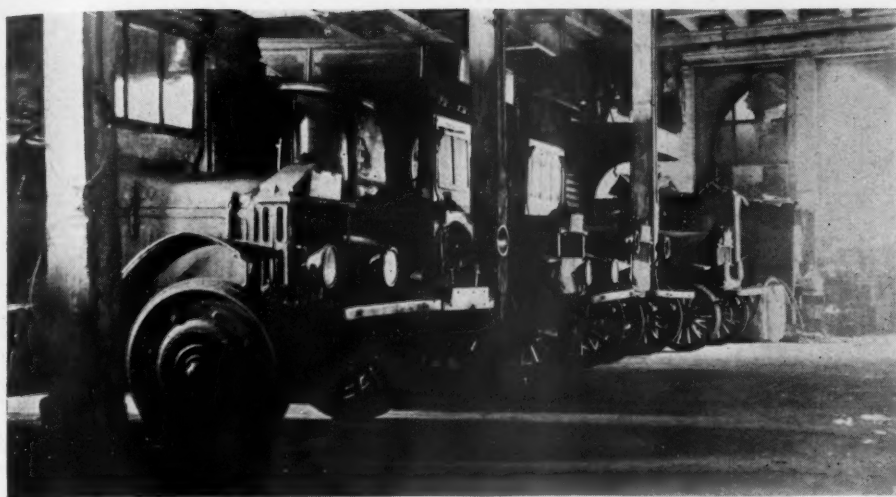
Five pounds at one end of a side that is bruised or contaminated in shipment will eliminate all the profit on that piece. Of course, the express company is responsible for damages. You can enter a claim, but if you have had experience in that line you probably know how profitable such action is. With the trucks, however, the meats and provisions are given much better consideration because the driver knows how important it is to deliver the orders in the best condition. This lessens complaints from customers and increases satisfaction all around.

Quick Service is of Inestimable Value

Quick delivery is essential to success in the packing business. The dealer generally likes to have his order delivered in the forenoon. Under the old system there was no assurance of any definite time when deliveries could be made. A salesman would take an order and promise to have it delivered sometime the following week. The express service was seldom quicker than four days. Goods shipped on Saturday would probably be delivered the following Tuesday. Consequently, the dealer looked for his order on any of the incoming trains that



A Five-Ton Pierce-Arrow Coming Into Pittsburgh After a Hard Grind to McKeesport and Intermediate Points



A View of the Trucks in Place in the Garage. This Building is the Old Stable

day. If it did not arrive, as often happened, he would wait a day or two and then 'phone the company about it. Now, however, when a salesman is given an order the dealer wants to know, not when it will be delivered, but what time tomorrow or the following day. By reason of the motor-truck delivery the salesman can promise delivery within a two-hour period. From a four or five-day delivery schedule the trucks have narrowed it down to within two hours.

In Constant Control of Shipments

Another minor advantage of the trucks is the fact that the sales manager at the office is always in touch with the goods in transit. If a dealer should turn dishonest and pay by bad check for his order on Saturday, say, and on Monday his check went to protest, if another order had already started for his store it could be held up and brought back by telephoning the driver. When shipped by express, once the goods have started, it is almost impossible to hold them up. The office is in touch with the goods until delivered.

When the company's own employees deliver the meats and provisions direct to the dealer, he can see that everything is O. K., and if not, is right on hand to take the stuff back. Considerable trouble and delay in payments are eliminated because the driver delivers the goods, receives payment, and the deal is closed to the satisfaction of both parties. Receipt is given at the time of payment, and all complaints are taken care of immediately.

Altogether, the better service rendered the trade has greatly increased the company's business in the last two years. Mr. McAleese says that, for a sales promoter, nothing can touch the motor truck. Sales have tripled in many towns since motor truck service was started. Not long ago one refrigerator car and one truck load of orders were sent to Denora each week. Now one car load and five truck loads are sent. This increase is due entirely to repeat orders resulting from the satisfactory service given by the trucks.

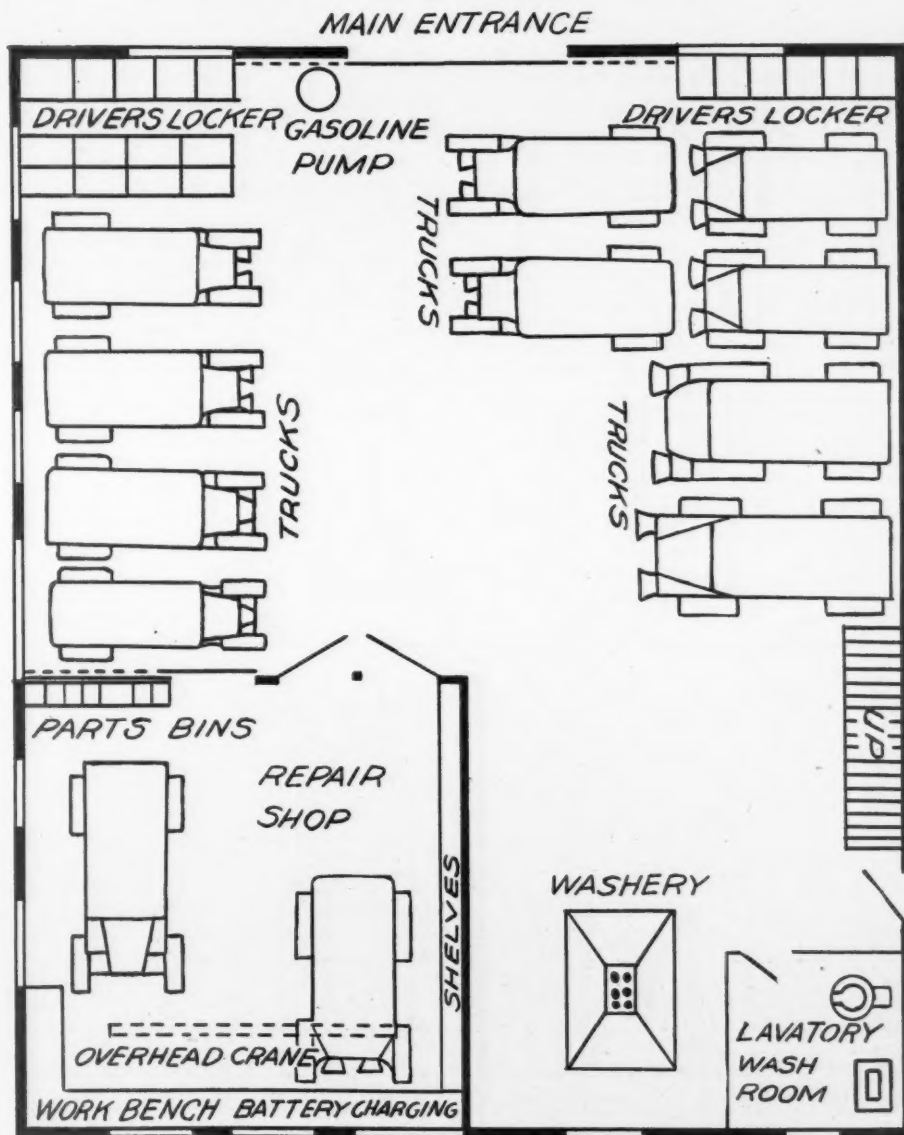
Successful Despite Adverse Conditions

The fleet of 18 Pierce-Arrows, 3 Whites and 1 Packard is subject to the most gruelling work that could be given a truck. All the towns within a 55-mile

radius of Pittsburgh are served and most of the towns within a 75-mile radius. This means that the trucks are depended upon to supply meat and provisions to a buying population of 1¼ millions. About 220,000 lb. are handled by the trucks each week, and this tonnage is transported over roads that are often little more than a trail.

The performance of the Pittsburgh Packing and Provision Co.'s trucks proves that despite the disadvantage of unfavorable operating conditions, they can be depended upon to give better service than any other medium. Last winter the condition of the roads was without parallel in the history of that section. The severe winter and the big snow-storms prevented the railroads from reaching many of the towns around the big city.

Realizing these conditions, the Pittsburgh Packing and Provision Co. decided to go to the aid of the marooned towns, and the trucks were sent out with meat to battle their way through the snow drifts in the mountains. The drivers often had to shovel a path for considerable



A Plan of the Lower Floor of the Old Stables as It Has Been Remodeled to Take Care of Storage of the Fleet of Trucks. Eighty-eight Head of Horses Were Once Used

Of the twenty-two trucks in the fleet, all are 5-tonners with the exception of two Whites and one Pierce-Arrow, which are of 2-ton capacity. These trucks are sent out on a trip early in the morning—at 1 or 2 A. M., and by 6 or 7 A. M. they are at a town fifty miles away, ready for delivery. By noon all deliveries are made. Dealers have gotten into the habit of calling up at 10 o'clock, say, if the order is not delivered when it was

[illegible]

GASOLINE MOTOR TRUCK REPORT																																	
Date of Purchase		June 15 1917																															
Name of Truck		Price - \$		No.		Capacity																											
Original Cost		4664		63		Depreciation Basis 20% yearly																											
MONTH	Days Operated	MILEAGE	DRIVERS AND HELPERS WAGES			GASOLINE			OIL			GREASE		REPAIRS		GARAGE EXPENSE		INSURANCE		TIRES	MISCELLANEOUS DEPRECIATION	Total Operating Cost	Tonnage Hauled	Cost per Cwt	Cost per Mile								
			Gals.	Amount	Mile per Gall.	Gals.	Amount	Mile per Gall.	Lbs.	Amount	Material	Labor	Liability, F. & P. (See Note)	Collision																			
July 1917	24	1034	220	50	269	61	87	3.8	1 1/2	162	230				4	36	35	75	6	32	12	25	44	36	77	74	384	33			45		
Aug	27	931	203	04	272	62	56	3.4	3 3/4	135	248				33	1	93	35	75	6	32	12	25	37	24	77	74	438	51			47	
Sept	25	718	217	50	230	58	20	3.1	3 3/8	130	191				12		84	28	80	6	32	12	25	28	72	77	74	428	79			60	
Oct	27	841	224	75	292	70	08	2.8	4 1/2	162	187				38	2	43	17	88	6	32	12	25	33	64	77	74	447	09			53	
Nov	24	970	221	52	297	74	25	3.2	3 3/4	117					6	34	4	50	23	50	6	32	12	25	38	50	77	74	466	19			48
Dec 1918	23	906	242	42	342	75	00	2.7	3 1/2	126					69	1	95	28	66	6	32	12	25	36	24	77	74	507	03			56	
Jan	29	1629	292	03	727	182	25	2.2	6 3/8	238					1	04	1	82	28	83	6	32	12	25	65	16	77	74	669	82			41
Feb	26	1236	270	40	641	172	73	2.0	8 1/2	297							4	92	18	35	6	32	12	25	49	44	77	74	615	12			50
Mar	26	974	256	10	427	111	22	2.1	4 1/2	140					11	05	24	91	18	85	6	32	12	25	38	96	77	74	558	80			5

The long strip represents a portion of a leaf from a 14x17 in. ledger. One sheet is used for each truck and from the reports that come from the different departments the monthly summary is made. The auto truck report is filled out each day by the delivery superintendent's office. The numbers across the top represent the different trucks. For the entire twenty-two an additional sheet is used similar to the one shown above.

promised at 8.30. The marvel of the truck service to the men in the company is that in seven years' time the schedule of delivery has been confined to a two-hour limit, instead of a week.

Service Car Keeps Trucks Running

The trucks are kept running at all costs. A service car made from the chassis of a Pierce-Arrow touring car is ready at all hours to go to the assistance of any of the drivers who get stalled on the road. Several sets of block and tackle and a heavy-duty jack are carried. A 'phone call to the home of the delivery superintendent or his assistant is all that is required to start the wheels of the service car moving in the direction of the stalled truck. Many tales are told of feats performed by this service car in assisting its big brothers out of a hole.

At the home plant, the lower floor of the big building, once used as a stable for the 88 head of horses, 60 of which the trucks have replaced, is used as a garage and repair shop. The service of the truck dealer is not depended upon.

Several expert mechanics in the repair shop, maintained in the garage, take care of all necessary overhauling and repairs, and keep all the trucks in running order. A stock of parts most in demand is also kept on hand. This obviates the delay often experienced when a dealer is without the needed part and must wait until it is sent on from the factory.

The garage is very complete and, as a converted stable, serves its purpose very satisfactorily. Lockers are provided for the drivers so that they can change their street clothes for the white suits they wear when delivering.

Complete Records Great Help

Speaking of keeping a record of costs, the secretary of the company says, "We don't fool ourselves. Everything is included—depreciation, insurance, tires, garage, overhead, etc. We know just how much each one of our trucks costs us. It is difficult, however, to determine the cost per ton or per hundred pounds because the loads vary, and the drivers we have had to accept lately did not keep an accurate record of the tonnage they

hailed. I would estimate the cost, however, at about 45 or 50 cents a hundred, which is cheaper than prevailing express rates."

Complete records are kept of the cost of each truck as shown by the monthly summary. The garage expense item is the cost of storing the trucks in garages in other towns over night when a trip requires more than one day. A truck is out often for a period of three days. There is a Gasoline Motor Truck Report sheet for each truck, but there is sufficient ruling on one sheet to last four years. The sheets are kept in a large ledger and are very neat and accurate. They stand for efficiency in motor truck operation through the knowledge that each truck is costing so much a month, and each item that enters into the cost is kept separate so that it is easy to determine where there is too much expense, if such exists.

"If it had not been for the truck we would now be out of business," said John J. McAleese, "and believe me, for increasing sales nothing can beat the truck."

Washington Community Market Helps to Reduce the H. C. L.

HANDLING solid truck loads of farm produce practically direct from producer to consumer, without a single kick from either end of the line in a period of six months or more, the Park View community market, of Washington, D. C., operating in the rooms of the community center at Park View school, has set an example that is being copied by other community centers in various parts of the city.

Managed by John G. McGrath, "the father of Park View," the community market has been a success from the first. Supplied by farmers and producers living along rural mail routes extending as far as Gettysburg, Pa., and Leonardtown, Md., all manner of farm produce is brought direct to consumers, with only the intervention in the direct line of the handler at the Park View midway station—the community market.

Producers consigning their goods to the Park View market receive checks for the consignments the day following shipment; in fact, the checks are mailed the night the consignment is received. This is a feature that has met with the most enthusiastic favor from producers.

Goods that require grading are graded free of charge, and prices are made on the basis of the highest wholesale prices for similar goods of equal grade. Consigners are paid in full, no deduction being made for commissions. Retail buyers obtain the goods always at a few cents under the regular retail price. For example, with first class country butter selling at retail stores and stands for 45 cents a pound, patrons of the Park View

market buy the same quality of butter for 42 cents. Country sausage retailing at 45 cents goes to Park View consumers at 40 cents. Oysters such as retail for 60 cents a quarter, are sold to patrons of the Park View market at 45 cents. And so on down the list.

Produce of all kinds is sent to the market by post office trucks. One such consignment consisted wholly of fresh pork and pork products. The consignment contained several hundred pounds of spareribs, "with plenty of meat on 'em," as Mr. McGrath explained—backbone in the same condition, fresh home-made sausage of highest quality, fresh hams and shoulders, lard made from all-pork fat, etc.

Shipment of oysters to the Park View market has been a feature during the winter just closing. The oysters come from Chesapeake Bay oyster beds, and are always of the highest quality and tonged or dredged usually the day before they are received.

During the entire winter the market has specialized in fresh eggs without a single complaint from consignors or buyers, and always underselling regular retail markets by from 5 to 10 cents a dozen.

The market is operated by the Park View community center, its direct management and control being in the hands of Mr. McGrath. The system of disposing of produce consigned to the market is simple in the extreme. Regular Park View purchasers know all about it, so there is no necessity of notifying them. When extra heavy shipments arrive, Mr. McGrath provides for the regular patrons

of the market, and, to dispose of surpluses, advises heads of other community centers in different parts of the city, these in turn ordering and calling for such supplies as they can use.

The market maintains no delivery system and has no charge accounts, its business being done strictly on a cash basis. With no overhead for delivery, bookkeeping, etc., and no bad accounts to be prorated among patrons who do pay, expense is reduced to the minimum.

Having no refrigerating or cold storage plant, it is expected the market can only be operated during the late fall, winter and early spring months. Even under these conditions, however, the market has proven itself a money saving proposition for hundreds of Park View residents, and it is hoped arrangements can be made whereby it may be kept in operation during the entire year.

Allied Industries Corp., New York City, of which A. I. duPont is president, and which has branch houses at London, Paris, Manila, Buenos Aires, Rio de Janeiro, Santos, Sao Paulo, Demerara, Trinidad and Surinam, announces that it has taken over the business and agency lines formerly handled and controlled by the Star P. & V. Corp., of 106 Fulton St., New York. Included in this transfer of interests are the Gary truck, Fruehauf trailers, Esta water auxiliators, Federal rubber tires (for certain markets). W. P. Berrien, who was formerly an executive of the Star P. & V. Corp., will give his entire time and attention to automotive lines.

EFFICIENT REPAIR METHODS



Editor's Note: This department is conducted primarily for the new repairman and dealer; also the repairman in the smaller towns who is anxious to place his shop on a better paying basis and do his work in a more systematic manner. We shall appreciate any suggestions or criticism that will help us make this department satisfy your needs.

Overhauling the Rear Axles of Types 20 and 21 Vim Chassis, and Restoration of Worn Parts

THE rear axle of Vim trucks is of the three-quarter floating type. To remove the rear axle of Vim trucks, types 20 and 21, as for a complete overhaul, remove spring clip nuts and spring clips on rear springs and spring pads. Take out six bolts securing flange of third member to propeller shaft, to disconnect propeller shaft and drop shaft. Disconnect service and emergency brake rods at brake levers.

Jack up or hoist body until springs clear axle and run out axle. Then place boxes or horses under each of the rear springs so that the chassis can be lowered on these supports while the work is being done on the rear axle. Place axle upon stand, remove hub caps, using special wrench, and displace cotter pins locking axle nuts. Take off axle nuts and remove wheels, using Vim wheel puller. (See illustration). Axle is tapered and wheel is keyed. Take off nut and washer at either end of truss rod, drive rod out sufficiently to clear hole in drum and displace truss rod.

Disassembling Housing

Remove the nuts from the flange of the third member housing and then remove the third member as a whole. Remove differential housing nuts and bolts (9), using two $\frac{3}{8}$ -in. wrenches. Take out five bolts, then reverse axle on stand and take out balance. Pull housing apart and let oil drain in box, the bottom of which should be filled with saw dust or

shavings. Remove right and left housings and bearings. Remove roller bearings, shims, thrust bearings, flat washers, felts and washers holding felts on either side of differential housing. Wash clean the parts with kerosene.

Clamp differential in vise, with axles vertical, and remove differential case, plain half, by removing the four lock wires which lock the cap screws and by taking out eight $\frac{3}{8}$ -in. cap screws which bolt the plain half to ring gear half of case. A socket wrench is best for this work as heads of bolts are not readily accessible with S wrench. Lift off axle with plain half of differential case and displace compensating gears on spider. These gears float on spider, which has a pin extending through it, a loose fit. Remove other axle from ring gear housing.

Note: If wheel keyways be badly worn it will be necessary to use new shafts. If pinion gears on shafts are loose, due to wear of the square end of shaft, removing gear and replacing it so as to bring unworn surfaces together, may remedy the trouble. The pinions are retained by a castellated nut, cotter pinned. A standard cotter pin tool is handy for removing cotter pins and bending ends flat when fitting new cotters.

Testing Mesh of Gears

If ring gear teeth be broken, replace with new gear. If at any time an accident has occurred which has caused the

teeth of the gear to break, the housing should be carefully checked to see that it has not been sprung out of shape, which would cause the gear to be out of true in relation to the pinion gear. Ring gear is riveted to differential case by 12 rivets. Replace axle with axle gear in

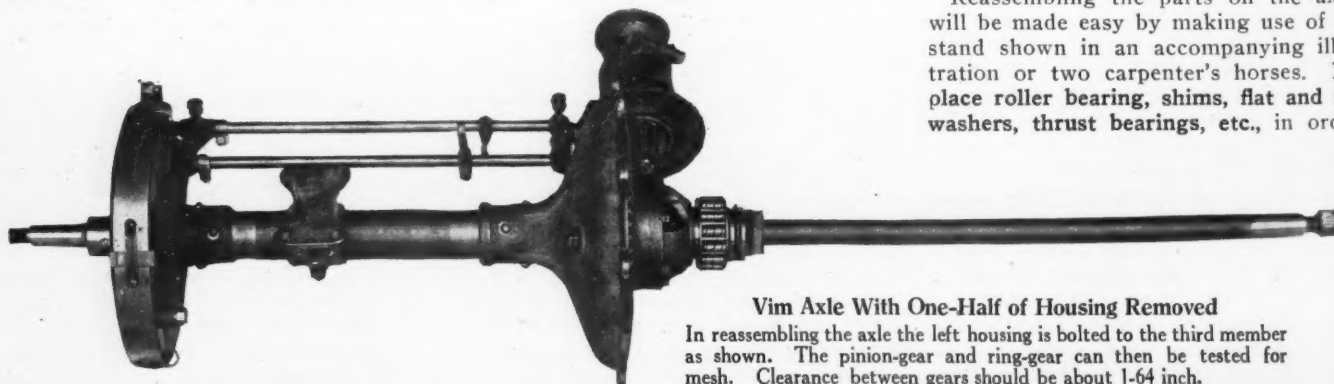


Showing Brake Drum and Axle End

The arrow points to the hole through which the truss rod extends

differential gear case, insert spider with compensating gears, and be sure pin in spider is in place. Place other axle with axle gear in plain half of differential case and bolt two halves of differential case together. Tighten up bolts and test action of compensating gears. Lock differential housing cap screws with wire as shown.

Reassembling the parts on the axles will be made easy by making use of the stand shown in an accompanying illustration or two carpenter's horses. Replace roller bearing, shims, flat and felt washers, thrust bearings, etc., in order,



Vim Axle With One-Half of Housing Removed

In reassembling the axle the left housing is bolted to the third member as shown. The pinion-gear and ring-gear can then be tested for mesh. Clearance between gears should be about 1-64 inch.

on the left axle housing and slip the left axle, which is held in a vertical plane, into place in the housing.

Testing Pinion and Ring Gear Mesh

Test mesh of pinion and ring gear before replacing right axle housing. Set third member in place (housing with pinion) and secure it to housing (left half) with two bolts and nuts. Rotate pinion shaft and note mesh of pinion with ring gear. The clearance should be about 1-64 in., and the backs of the gears should be about flush. There should be a perceptible amount of backlash or play, and the adjustment largely determined by "feel" experience. It is imperative that the teeth on the pinion gear and the teeth of the ring gear should be exactly parallel, and the back end, or large end of the pinion gear teeth, exactly in line with the outside edge of the ring gear teeth. If these edges do not line up, an adjustment can be accomplished by moving the pinion gear in or out of mesh with the ring gear by means of adjusting cage in the third member housing. **Adjust ring gear if pinion bottoms**, or is too close. This is accomplished by removing the axle from housing and taking out or putting in the necessary shim back of thrust bearing.

Note: No attempt should be made to change the relation of the ring gear to pinion by shimming until pinion is adjusted correctly.

Adjusting Pinion Gear

To adjust pinion remove capscrews (2) retaining lock plate to third member housing, exposing slots in cage. Loosen clamping bolt of housing, which

place lock plate and screws, tighten bolt and lock nut of housing.

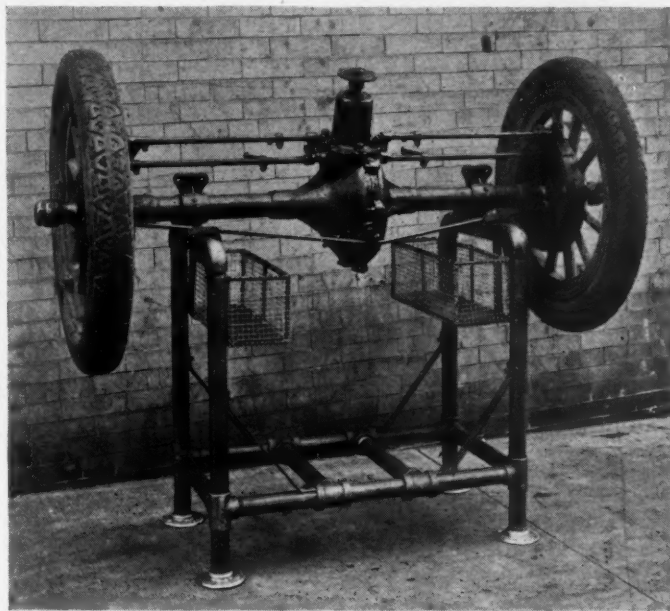
Overhauling Third Member

Ordinarily the only attention the third member will require, other than lubrication, is to note if the flange is free from

sembled. Displace flange, wire lock, adjusting nut, felt washer and retainer and pinion which is keyed to shaft; these are in the slotted cage. The shaft has two bearings. The adjusting nut of these bearings is locked by a wire ring, an extension of which passes through a slot

Vim Rear Axle Overhauling Stand

This stand is used by the Vim service stations. Note the wire cages for holding bolts, nuts and small parts. A wooden stand or box, about 2 ft. high, with bottom covered with sawdust to soak up oil, would be just as practical, but not as serviceable.



in nut and shaft. Adjustment of bearings can be made with the third member completely assembled by releasing locking nut and turning nut.

Reassembling Rear Axle

With pinion and ring gear properly meshed, replace bearing, shims, etc., on right axle and replace right axle housing. Bring halves together, align bolt holes, insert three bolts spaced equally apart, and start nuts. Set axle housing on stand, replace balance of bolts (9 in all), lock-

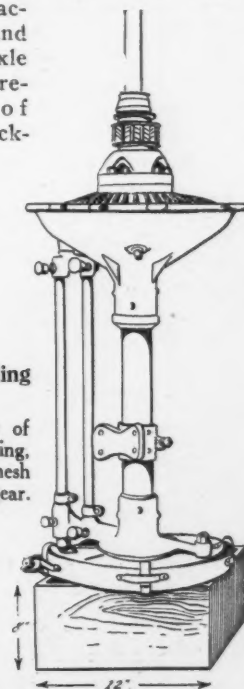


Enlarged View of Differential and Pinion

The adjustment is made by moving the pinion gear in or out by means of notches in the cage, threaded in third member housing. Third member slot shown.

Stand for Assembling Axle

Simplifies the work of replacing axle in housing, fitting and testing mesh of pinion and ring gear.

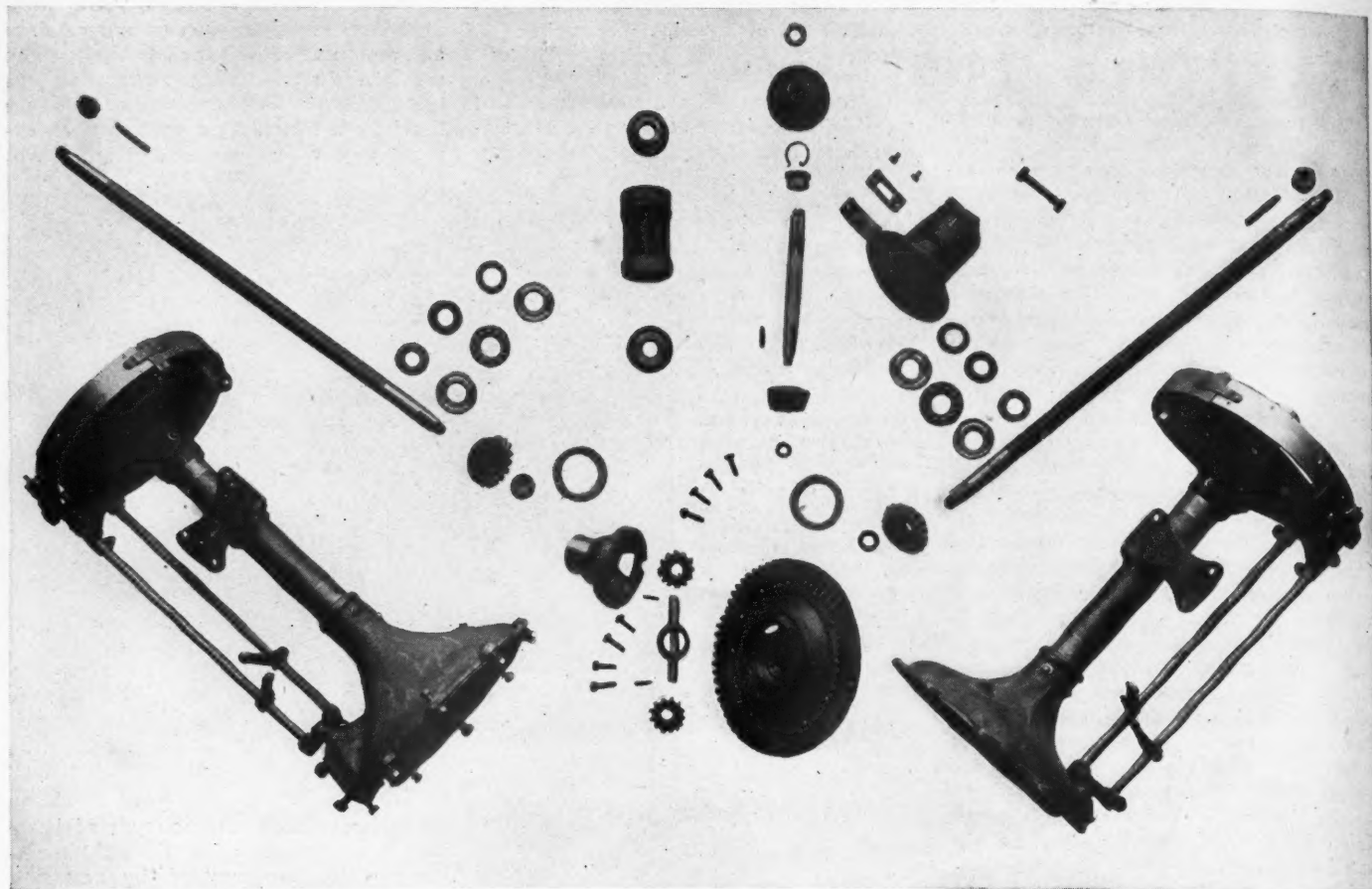


is slotted. Insert a tool in slot of cage and turn it, which will move the cage, carrying the pinion and its shaft backward or forward, as may be required to make the adjustment. If satisfactory, re-

play on the squared end of pinion shaft. To remove flange, clamp pinion nut in vise with third member in vertical position. Take out cotter pin in flange nut and remove nut. Slip off flange, turn and replace to bring unworn surfaces together. Replace flange, nut and pin.

If a new flange and shaft be necessary, the third member will have to be disas-

sembled. Renew lubricant and bolt third member to differential housing. Replace truss rod, and lock washers and nuts. Replace wheels, etc., and reverse the order of disassembly when returning rear axle to the chassis.



The Vim Axle Disassembled and Showing How the Various Parts Fit in Relation to One Another

To oil the differential, have one of the rear wheels of the truck free so that it can be turned by hand. Then remove both plugs in the differential housing, and use a grease gun to fill the housing through the top hole. Turn the wheel by hand when filling the housing so that the lubricant will run through the gears, and when it overflows through the lower hole it has been filled to the proper level.

After putting in a sufficient amount of lubricant let the axle stand five or ten minutes so that if there is too much in it, it will overflow and run out of the hole

again. The oil in the differential should be at the level of the lower plug hole. Remove the plug in the third member housing and fill with the same lubricant.

Note.—When replacing the rear axle under the truck and hooking up the brake pull rods it would be advisable to check up the action of both the service and emergency brakes and if any adjustment is necessary it should be made at once. The foot service brake consists of contracting bands operating on the exterior of the rear wheel brake drums and the adjustment of which may be made by means of the wing adjusting nut at the front or open end of the service brake. These bands should be adjusted as close to the drums as possible without dragging on the drums. The emergency brake can be adjusted by shortening the brake pull rod where it joins the brake levers at the rear axle housing. These brakes also should be adjusted as close as possible to the drums without dragging.

Moltrup Steel Products Co., Beaver Falls, Pa., manufacturer of cold drawn steel shafting and screw steel, finished machine keys, etc., announces the opening of its eastern branch office in the Woolworth Bldg., New York City. J. J. Callahan is in charge of the agency.

L. V. Flechter & Co., Long Island City, N. Y., announces the opening of a Los Angeles branch. M. J. Siebert, who has recently been discharged from the Army is in charge.

Famous Trucks Gives a Banquet

ST. JOSEPH, MICH., March 18.—A dinner was given recently by Frank N. Wilkinson, president of Famous Trucks, Inc., to one hundred business associates.

At the dinner the completion of a new heavy-duty truck to be sold at \$1650, was announced.

An address on "Motor Trucks and the Tractor Market" was delivered by Herbert D. Allen and a talk on the technical side of the motor truck was given by Henry A. Wagner, chief engineer of the Famous company.

Auto Express Between Cleveland and Pittsburgh

The Union Transfer Co., with headquarters at 226 East Boardman St., Youngstown, Ohio, is conducting a motor express service between Cleveland and Pittsburgh, via Youngstown. Offices are maintained in Youngstown and all orders received there. No consignment of less than 500 lb. is accepted.

Eleven auto vans are operated by the Union Transfer Co., one truck leaving Pittsburgh for Cleveland and another leaving Cleveland for Pittsburgh every day. It requires two days to cover the distance one way.

O. R. Adler is manager of the company.



Vim Wheel Puller Utilized by Vim Service and Repair Shops

A New Steel Mill of Unusual Construction

THE rapid expansion of the steel industry during the last few years has brought with it wonderful developments in the design and character of producing equipment. A most interesting feature is the construction, equipment, design and successful operation of the National Pressed Steel Company's strip mills at Massillon, Ohio.

The greater demand for pressed steel in the building of motor trucks, tractors, passenger cars, airplanes, and many other products, indicated that a wide field existed for material of not only standard formulae but also alloy steels which would meet the complete requirements for the manufacture of pressed steel specialties.

Planning the New Mill

With this in mind a group of young men familiar with the difficulties encountered in deep drawing, stamping, forming and pressing of steel products, and

also the need for new and better qualities, set out to build a mill to meet the new demands. Their aim was to produce a wider range of sizes and the proper quality and physical characteristics in hot and cold rolled strips especially adapted to this particular class of work.

Representative lots of steel intended for stamping and similar purposes were carefully analyzed in many ways. The results indicated the fact that while in the past research work had been carried on to improve the composition of steels in general, and that while some attention had been given to scale elimination, etc., very little thought had been given to the subject of mechanical treatment. This investigation and careful research convinced the designers that new methods and practice were necessary.

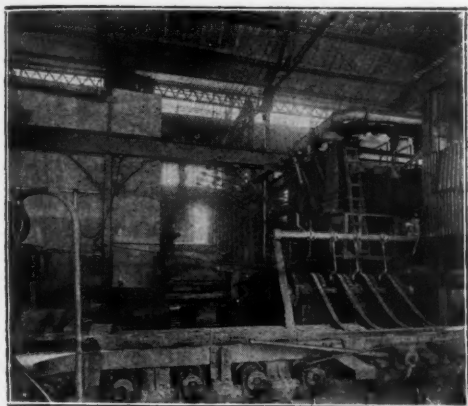
All the information and data obtained pointed to the necessity for a departure from standard machinery, methods and practice. Before designing the machin-

ery, equipment and plant, which for the new purposes required many innovations in heating and rolling, it was considered necessary to consult the trade purchasing and using this class of steel in order to obtain data and authentic information.

An abstract was accordingly prepared containing thirty-seven questions, each one important to the establishment of the new methods thought necessary, and so prepared as to require little time and effort on giving the answers. This was sent to a large number of manufacturers producing pressed and drawn steel specialties, and brought forth immediate and enthusiastic response. The returns reached forty-seven per cent, which answered in whole or part the abstract.

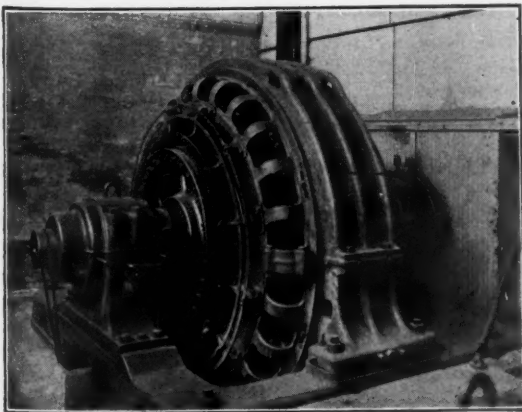
Mill Completed in Ten Months

With the complete data and reliable information then at hand bearing on size, finish, analysis, quality, physical characteristics, etc., the design of this



Partial End and Side View of the No. 1 Heating Furnace

A portion of the mill approach table, roller table and delivery end of the slab transfer is seen in the foreground. Above the top of the furnace may be seen the pipes thru which is conveyed the air and powdered coal, by means of which the furnace is heated.

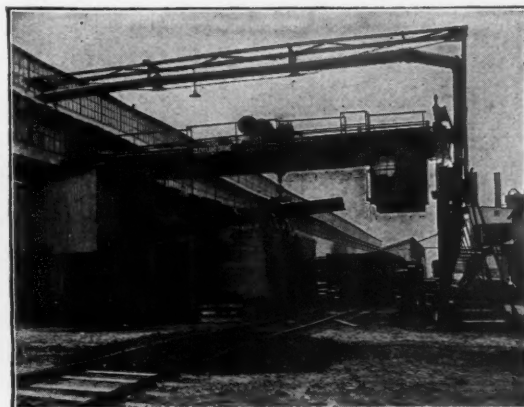


Westinghouse Reversing Mill Motor

This was designed and built especially for this installation. To one watching it in operation, it causes an almost uncanny feeling. It's silent and almost instant reversal from full speed in one direction to full speed in the opposite direction, gives no indication of the tremendous power being developed.

Charging End of No. 1 Heating Furnace

The view to the right shows also the electric overhead traveling crane, serving the furnace. The slabs are picked up by this crane by means of a magnet and placed on the skids in front of the massive pushers. These machines are of unusually heavy design and are electrically controlled and operated. As hot slabs are drawn for rolling, cold ones are pushed into the furnace at the rear or charging end.



Transfer Tables Serve the 16" Finishing Mill

unusual plant was undertaken by the company's own men, carefully adhering to basic principles. In spite of adverse conditions in material and machinery markets, weather, etc., in ten months and one day from the time ground was broken the plant was in operation.

This plant with its special equipment, new methods and practice is now producing a material of such physical property and quality that without any annealing it can be used in a great many cases where formerly annealed strips were necessary.

Process of Manufacturing Strip Steel

Raw material is received in the form of slabs and billets and is unloaded from the cars by means of cranes carrying rectangular lifting magnets. Before any material is placed in stock or used, each piece is carefully inspected for seams, pipes or any other defects which could be rolled into the steel by later manipulation and not detected until the material was in the customer's presses. The stock yard has a capacity of from fifteen to twenty thousand tons of steel and adjoins the mill building.

Great care and attention were given to the design and detail for the furnaces to insure uniform heating. They are of the large continuous reheating type, using powdered coal as fuel. All parts and accessories were specially designed and constructed for this method of heating. Pushers, drawing machinery, door hoists, transfer tables and all equipment auxiliary to the furnaces are electrically operated. The steel is transferred to the roughing mill in a unique manner, and in such a way that practically all furnace scale is removed.

The roughing mill is a high speed 24-in. two high universal mill and is driven by a Westinghouse reversing motor, similar to those used in blooming mills but smaller and much faster. An idea of the extreme proportions of the mill will be conveyed by the statement that the housings weigh approximately forty-two (42) tons each, and that all other parts are correspondingly heavy. As this company produces large quantities of special alloy steels in the form of strips up to No. 00 gauge x 24 in. wide, the necessity for such heavy units will be appreciated. The extreme rigidity of the mill and foundations are also realized upon considering that when finishing, .50 carbon steel less than one thousandth inch (.001 in.) is allowed for spring of the mill. The vertical rolls on this mill are designed and operated so that proper side work may be given the steel. This method of rolling also holds the width dimension to slight variation.

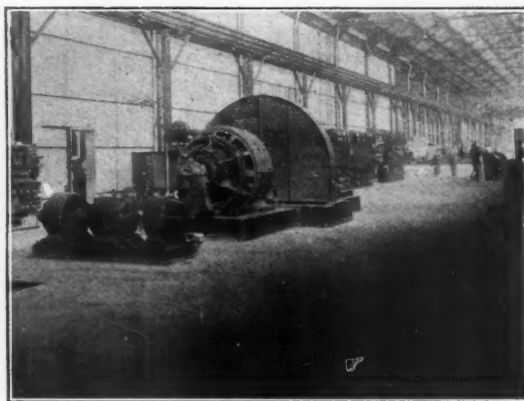
If the material is brought to gauge on the roughing mill, the strip is turned over after rolling, in order to facilitate inspection and remove any slight remaining scale. It is then transferred to a leveller or straightener of extremely rugged construction. From this the product is delivered to the hot bed.

When producing lighter material only the roughing operations are used on the

roughing mill, as a train of finishing mills has been provided for the final passes. These mills are operated entirely by mechanical means—no manual labor being required. Driving power is furnished by a Westinghouse motor of the Kramer type, permitting a wide range of operating speeds with good electrical efficiencies.

From these mills the material is delivered to hot bed or coiler as may be required. On leaving the hot bed the

The Illustration on the Right Shows a View Looking Down Through the Mill From a Point Near the 24" Universal Mill Rollers' Pulpit.

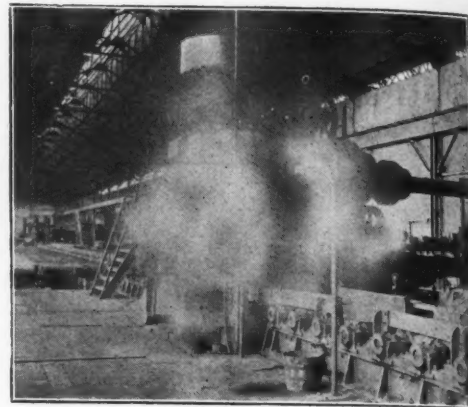


strips are cut to length and piled by a mechanical piler, placed in stock if they are to be shipped as plain hot rolled material or transferred to the finishing department if additional treatment is required.

In addition to the usual slitting, shearing, oiling and liming machinery, the finishing department has extensive facilities for heat treating and pickling. Each furnace has a charging capacity of approximately twenty-five tons and also the necessary mechanical means for reading and heat control, assuring uniform and proper heat treatment. The furnace men can observe and control the furnace temperature at all times, but the recording instruments and the records are seen only by the department superintendent, who thus has a definite and accurate record of all conditions and every operation employed on past work. The pickling vats are of the plunger type in standard details, but of large size for pickling large pieces whether flat or coiled. The steam for heating pickle liquors and other miscellaneous heating processes is generated by a boiler placed over the annealing furnace's flues.

The Research Department continues further investigation through their physical and chemical testing laboratories. These laboratories provide to the inspection department all tests needed to insure thorough knowledge of materials produced, the extent of tests being dependent upon character, quality and ultimate use of material on order.

The National Pressed Steel plant has a number of unusual and interesting features, viz.:



Motor-Generator Set Which Furnishes Power to the Reversing Mill Motor

The reversing mill motor (shown on preceding page) derives its power from the motor generator set shown at the left. To enable it to carry the peak loads, it is provided with a solid steel plate flywheel. This form of construction is necessary in order to withstand the terrific stresses produced by reason of its high speed revolution—the rim of this flywheel traveling more than four miles per minute.

Electricity used for power throughout; practical elimination of hard physical and hand labor; large clean, well lighted and well ventilated buildings; extensive methods and extra care to eliminate scale; unusual heavy equipment to bring size variation to a minimum, and unusual rolling methods to produce steels and alloys in steel.

Experiments, investigation and research as continued by this organization will doubtless develop further data and information to enable production of materials with other new qualities and characteristics, and thus the field for specialties manufactured from such source of supply will be extensively broadened and developed.

Parry Mfg. Co., Indianapolis, Ind., announces that its production of truck bodies since January 1 shows a great increase. January production figures were almost 90 per cent. greater than those for December, and figures for February show a gain of nearly 50 per cent. over those of January.



The Rim That Carries "Giants" Is Fit For Any Job

IF proof had been needed of the supremacy of Firestone Type C Rims for pneumatic tires it has been afforded by the success of these rims with Giant Pneumatic Truck Tires. Here, as on high-grade passenger cars, the established features of Type C Rims have shown their strength, their economy, and their practical, every-day convenience.

You remember these superiorities:

1. Continuous, one-piece base.
2. Continuous surface contact with felloe.
3. Continuous removable side ring with split locking ring.
4. Rim mounted on wheel with continuous wedge ring, the foundation principle of Firestone Rim success.

One man can make a tire change of the largest truck pneumatic tires when mounted on Firestone Type C Rims.

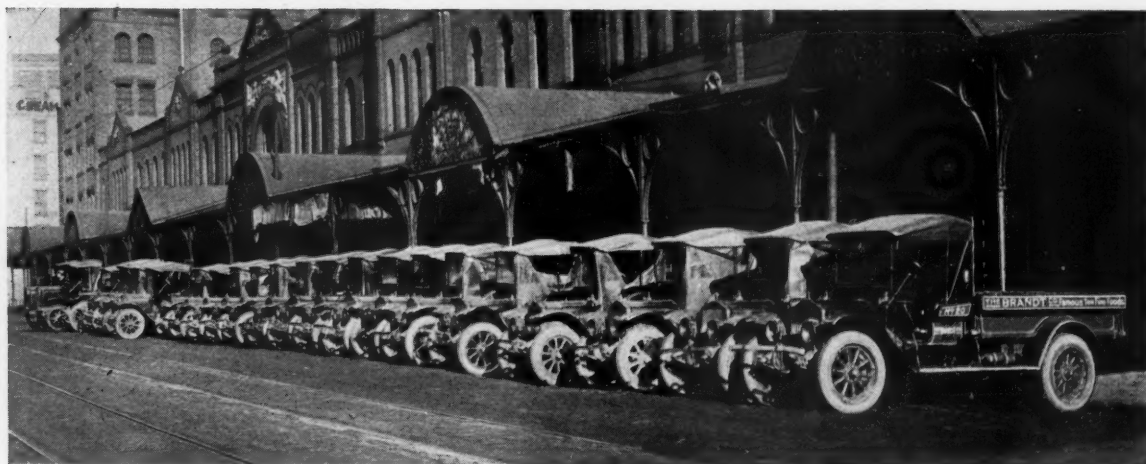
Firestone Type E Rims are just as successful in their field, for light cars.

If you want most mileage, least "grief" and greatest ease and convenience of tire change, see that your pneumatic tires have their foundation in Firestone Rims.

The Firestone Steel Products Co.

FIRESTONE PARK, AKRON, OHIO

One and a Half Million Pounds a Month on Pneumatics



Ohio's Largest Restaurant and Hotel Supply House Carries Its Deliveries to Distant Towns on Pneumatic Equipped Trucks. Nature of Goods Makes Use of Pneumatics Necessary

WHEN a fleet of fifteen trucks runs entirely on pneumatics the company operating trucks should be able to give some interesting data on the performance of such tires and their success. The Brandt Co., Cleveland, O., serves most of the big hotels and restaurants in northern Ohio with practically everything in the meat, vegetable, butter, egg, fish and sea-food lines. These products are perishable and deliveries must be made very quickly. Eggs and other produce are easily destroyed by vibration and cannot be as safely carried by trucks equipped with the so-called solid tire. Speed, however, is the big advantage secured by the use of pneumatics—so W. W. Mason testified in an enthusiastic comment on the success of the pneumatics used on the Brandt trucks.

The trucks often start out at 3 A. M., make an 85-mile run, and deliver all orders in time for the mid-day meal the same day. The development of the large pneumatic truck tire has added greatly to the dependability of this service. The Brandt Co. formerly used dual pneumatics on the rear but there was so much trouble due to blow-outs that the truck service could never be absolutely depended upon. When an inner tire blew out the trouble was practically quadrupled because of the difficulty of getting at the tire. When the larger pneumatics had passed through their experimental stage they were eagerly adapted and since then the truck service has been ideal.

The company operates 17 trucks in all. Four are 1½-ton Whites, 11 are ¾-ton Whites, and two are 5-ton solid-tired Whites. All but the two 5-tonners are

on pneumatics, both front and rear. The capacity of the trucks may not impress one as sufficient to make a prediction as to the future of the large pneumatic tire, but the loads these trucks haul show that there are great possibilities. The 38 x 7-in. pneumatics on the rear of these trucks are standing up well even under overload. One tire has run 15,000 miles and is good for about 5000 more. With such mileage the high initial cost of the tires will become less and less a factor in sales.

The tire expert, who has charge of the tire equipment on all the trucks, is running the tires at an approximate cost of one cent a mile. All the deliveries are not made in distant towns. Many places in Cleveland are served by the trucks. The length of the trips ranges all the way from ¼ to 85 miles.

W. W. Mason, treasurer and delivery superintendent, estimates that the cost of delivery by truck costs no more than if the goods were shipped by express. If the company had its own building, where more efficient loading methods and a cost record could be used, the cost would be much less. Under present conditions the trucks must back into a long alley-way for a distance of several hundred feet to the door which leads to the shipping room. There is no loading platform and all the packages, boxes, barrels, etc., must be carried into the alley-way and hoisted into the trucks by hand.

Maintain Own Tire Shop

One of the features that makes for success in the use of the pneumatic tire is the tire service station that the company maintains. Here an accurate record is kept of the mileage of each

tire. Every morning the trucks report to the tire man and have each tire fully inflated for the day. The large 38 x 7-in. tires are tested and kept at a pressure of 125 lb. The smaller ones are inflated to 110 lb. During the time these tires have been in service there never has been a blow-out, which is quite a record considering the fact that the trucks are often overloaded.

The tire shop is fully equipped for repair work. A vulcanizing outfit with the necessary large molds is in service. Practically the only additional requirement to give service on the giant pneumatics is the acquisition of several larger molds for vulcanizing work.

There is a large capacity air pump with a reservoir tank in the tire shop. The hose from this tank is carried from the second floor of the garage, where the tire shop is located, to the driveway where the trucks go in and out. This makes it very convenient and little time is required to test the tires and inflate them to the proper pressure each morning.

A stock of rims, inner tubes, casing and small parts is maintained so that there is no possibility of a truck being held up in its work because of tire trouble. All the tires are on demountable rims and a spare for the rear is carried on back of the driver's cab in addition to the spare for the front carried on the left running board.

The speed of delivery, made possible by the pneumatics in this work, means so much in service that the satisfaction of the patrons has manifested itself in a 400 per cent. increase in business in Youngstown alone. In fact, it is said that the new conditions made it possible

The Contented Driver

EASY steering makes Contented Drivers. It conserves human strength and increases efficiency in both driver and truck. It means a bigger day's work more easily done and greater satisfaction to both the owner of the truck and the man who drives it.

This Contented Driver is only one of 140,000 who go to their homes after a better day's work with lighter hearts and with less wearied bodies, because the trucks they drive are equipped with

ROSS STEERING GEARS

The special feature which distinguishes Ross Gears from all others is the screw and nut mechanism which transfers the action of the steering wheel to the steering arm. The nut is a solid piece, completely enveloping the screw, so that the enormous bearing surface on the threads of both screw and nut is utilized with every turn of the wheel.

These bearing surfaces not only make steering easy under all conditions, but they guarantee an unusual degree of safety and reliability.

Ross Steering Gears are now used as standard equipment by 120 different manufacturers, representing considerably over half the entire motor truck industry.

Write for catalog and any other information desired about "The Steering Gears that Predominate on Motor Trucks."



ROSS GEAR & TOOL COMPANY, 760 Heath St., Lafayette, Ind.



One of the Ton and a Half Whites With 38 x 7 Pneumatics on the Rear
The spare tire and rim for the rear is seen back of the driver's cab

for the Brandt Co. to successfully compete with the local dealers in the towns that are some distance from Cleveland. The management can recall the time when the country club would phone at 11 A. M. concerning a delivery it was expecting, to be told that it had left at 6 A. M. and was on the road. Now the same customer can call at 11 A. M., give the order and have the goods within half an hour.

Last year the company did \$3,000,000 worth of business, practically all of which was handled by the fleet of trucks. Plans are under consideration to move to a building where the company will have full rights. Then a cost recording system and more efficient loading methods will be installed which, in turn, will

greatly increase the efficiency of the delivery service and reduce costs. At the present time the estimated cost of delivering 100 lb. to Youngstown compares very favorably with current express rates to the same town and horses and wagons are no longer even within the scope of consideration.

Mr. Mason believes that the big pneumatics will mean much to the future of truck service and especially in businesses where perishable stuffs, that must be handled with speed and at the same time with care to prevent turning or deterioration, are being transported. He mentioned particularly the tractive qualities of the pneumatics, especially on poor roads where rain had turned the bed into mud.

A Display That Has Merchandising Value

A great deal of comment was caused by the little boiling display which the Motometer Company, Inc., Long Island City, N. Y., exhibited at most of the recent automobile shows, with the express purpose in view of demonstrating to the public in a practical manner how the Boyce Moto-Meter is used in warning the driver whenever his engine is liable to over-heat.

Jobbers and dealers who contemplate holding their own accessory exhibits can readily construct this apparatus themselves at a very reasonable sum. The construction of this display stand follows:

It consists of a mahogany case 15 in. high by 24 in. long by 12 in. wide, with two holes about 3 in. in diameter drilled in the top to receive two glass bulbs of spiral design, as shown in the photograph.

The case has a large sized door in the rear, and a round hole cut into the front panel 12 in. in diameter. Fitted into this opening in the front panel is a plate glass with a transparent advertisement pasted thereon. The well-known picture of a man pointing to a Boyce Moto-Meter fitted into the radiator cap of an auto-

mobile was used in most cases. Underneath this picture appeared suitable wording matter, as an explanation.

Inside of the cabinet, and suspended from the top at about the center, is a forty Watt lamp. Hotpoint immersion heaters were used to heat the water in the bulbs. Caps of 1 3/4 in. outside diameter by 2 1/2 in. long were soldered around the small shank of the heaters close to the base, and the actual heating inserted into the base of the bulbs. These bulbs were held in position by means of a radiator hose of 1 3/4 in. inside diameter



Boyce Moto-Meter Display

shellacked into place, and held securely by means of hose clamps. Suitable electrical connections were permanently established inside of the case; the entire electrical installation leading into one socket, from the outside of the cabinet, so that the current could be secured anywhere by merely attaching ordinary extension cords to the lamp socket.

The bulbs were filled with distilled water, colored with a few drops of red or blue ink. The water in these bulbs will start to boil a few minutes after the current is turned on, and if a Boyce Moto-Meter is placed into the neck of the bulb, the red liquid in the Boyce Moto-Meter will at once rise to the line marked "Danger—Steam."

The hotpoints were set into the bulbs low enough so as not to be seen by the public after the bulbs were placed in position on the cabinet.

Watch for Him!

TRENTON, N. J., March 20.—The National Tire Co., of Trenton, N. J., announces that it has received a number of complaints from persons located in Indiana, Ohio and Michigan, concerning a man named E. M. Block, who has called on them and sold them a consignment of National tires and tubes for which they are to pay \$100. He usually collects about one-third of this amount. He claims to represent the National Tire Co., with general offices at Cleveland. There is no National Tire Co. in Cleveland, and the impostor's victims are writing the National Tire Co. at Trenton, to make good his arrangements, which, as far as can be learned, are made on the spot.

A Credit Bureau to Protect Milwaukee Tire Dealers

MILWAUKEE, WIS., March 30.—A credit bureau, designed to protect members against bad accounts has been established by the Milwaukee Tire Dealers' Association. The membership of the association includes a large percentage of the 225 tire dealers and repair shops in Milwaukee. All members have furnished credit information regarding their customers, which has been compiled and is now available for reference.

Almost all dealers have agreed to close at 6 P. M. and on Sundays. Service in gaging and filling tires will be charged for at the rate of 5 cents per tire. If owners perform this service for themselves no charge will be made.

Packard Will Refund Any Reduction in Price

DETROIT, March 14.—The Packard Motor Car Co. has notified its dealers that it will refund the amount of any reduction in the price of its cars or trucks that may be made in 1919. This "price insurance policy" will apply to all Packard vehicles delivered since January 1, 1919.

SIVYER CASTINGS

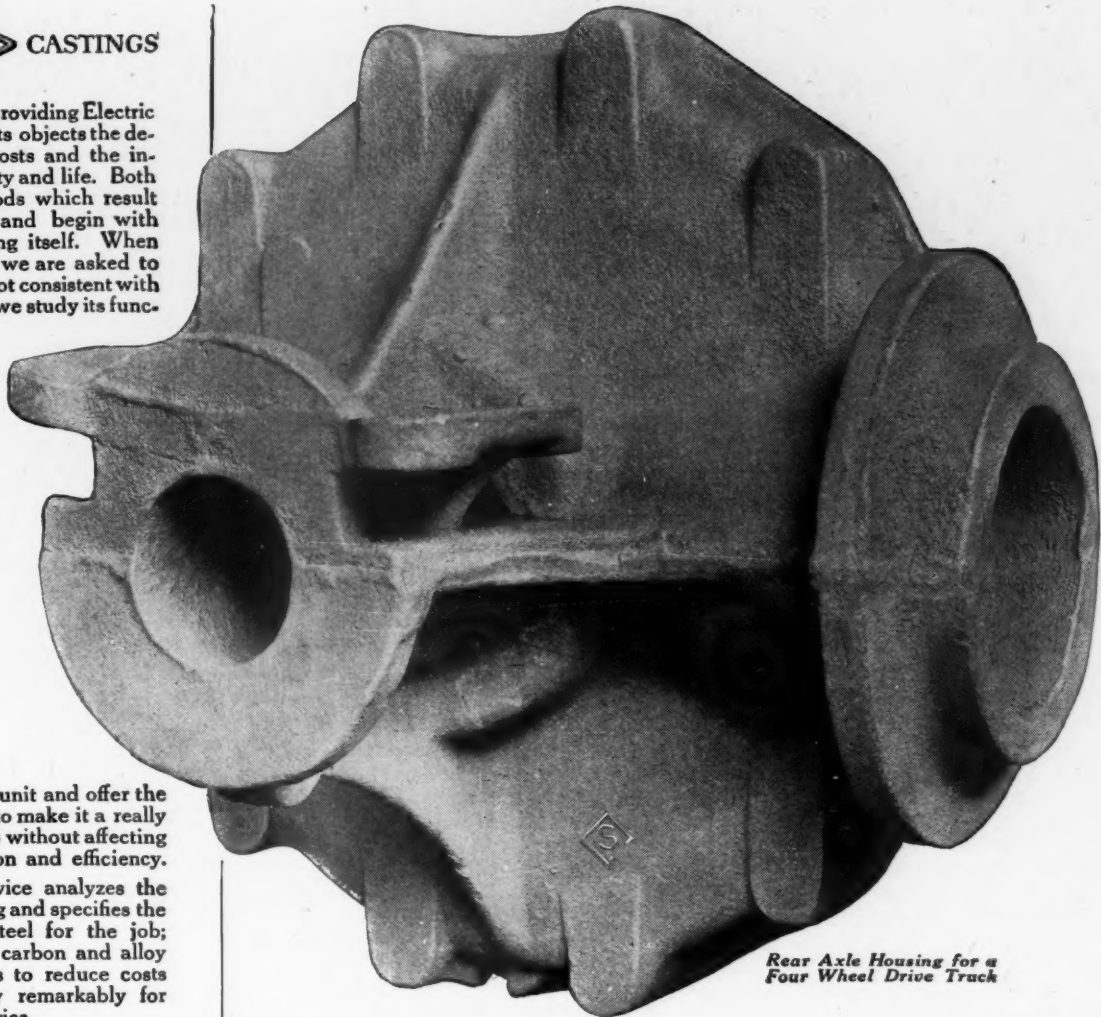
The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing-quality and life. Both are attained by methods which result from long experience and begin with the design of the casting itself. When we find that a casting we are asked to furnish is of a design not consistent with good foundry practice, we study its func-

tion in the completed unit and offer the necessary suggestions to make it a really practicable casting job without affecting in any way its function and efficiency.

Secondly, Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly, Sivyer Service makes a careful study of the pattern and molding problems involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

Fourthly, Sivyer Service analyzes carefully the proper annealing methods to be used and controls their proper application through unfailingly efficient equipment and men. In short, the Sivyer Service supervises every step necessary to secure unusually and unfailingly good castings of electric steel. It never relies on one factor alone, relies very little even on the natural freedom of electric steel from occluded gases and on its commonly recognized merit in resisting crystallization. It also depends but little on the inherent scientific accuracy of the electric furnace process. From casting-design to sand-blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.



Rear Axle Housing for a Four Wheel Drive Truck

AFTER certain manufacturers had experienced expensive difficulties in getting housings for the rear axles of four-wheel-drive trucks, they came to us. By the scientific use of risers we eliminated the difficulties others had had in getting the bosses of this casting uniformly sound. By our solution of the gating and core problems involved, we freed the castings from shrink holes and cracks that had previously made machining costs high. The successful solution of every factor in the molding problems involved in this casting, is typical of the thoroughness which has made the market for Sivyer Castings a national one.

SIVYER STEEL

SIVYER  STEEL CASTING COMPANY, MILWAUKEE

Meetings Between Employer and Employee Result in More Prosperous Business

Putting New Life Into Your Business and Contentment Into Your Employees Through Organization Meetings

AND that night there gathered about the big rectangular table some fifteen members of the dealers' organization to discuss business and working problems in an intimate, informal way, without the restraining hand of authority to awe into silence. Men who worked in the shop, in the office, and on the road all day gladly availed themselves of the opportunity to take part in a meeting of this kind. If there were claims or grievances to be heard this was the place to bring them. If the week had taught the desirability of this change, that improvement, or any new equipment, the meeting afforded a place to bring the proposition.

It was the Lawfer Automobile Co.'s organization that gathered for that particular meeting and few were absent. The great purpose in such a means of getting the employer and employee together is to promote a better understanding between the two, to create in the mind of the employee a realization of the vital part he plays in the conduct of the business and to give the employee an opportunity to voice his suggestions for the betterment of conditions, especially in regard to the work he does. A sense of responsibility is developed and this more than any other single thing tends to make a workman most productive. Self expression and self development go hand in hand. If one is repressed the other stagnates, and the loss is the workman's as much the employer's.

There is probably no other method so successful in cultivating the proper spirit in the employer and employee as regular informal meetings. For the dealer who has done little along this line the better plan is to start at the bottom with organization meetings which will create a more desirable relationship and understanding between employer and employee, and will often point the way to future policies. If you are to compete successfully with other dealers you must work out a way to let your employees share with you the responsibility.

For those who are slow and dubious of the results to be obtained from organization meetings or who have tried such a plan and found it unsuccessful, the results obtained by the Lawfer Automobile Co., of Allentown, Pa., are well worth considering.

One of the most pernicious things found by the Lawfer brothers was the "I don't care" spirit of the employee—lack of responsibility and consequently lack of genuine effort. This was due to lack of interest in the work. A recent article in *System* has this to say on the subject:

"The feeling of being an automaton with a lack of responsibility that goes with it, is the greatest cause of the workman's dissatisfaction. Unfortunately, the workman has, in too many instances, accepted this state of affairs as inevitable in the modern industrial world, so that his idea is to shorten hours and raise

floor creating an appearance of disorder. These conditions were noticed by shopmen who ordinarily are not given credit for having sufficient intelligence to know the deleterious effects of such practices. Through the meeting they were brought before others.

The Tool Room Was Systematized

As it was, the Lawfer brothers decided to systematize the tool room, adopt the check system and put a man in direct charge. The plans were discussed by everyone and suggestions coming from the shopmen, who knew just what were needed, were adopted. In fact, it is found in meetings of this kind that many employees have had valuable experience in other concerns and they can give many valuable suggestions as a result of their experience, when encouraged to do so. Without the encouragement, which in this case was given by the meeting, the knowledge and experience would be lost in the present connection.

As regards the tool room question, it was realized that a man in charge of that alone, would have considerable spare time which should be profitably employed. At what? Instead of dictating what, one of the experienced shopmen was asked to make a list of some of the things he thought such a man could do efficiently in connection with his tool room supervision. That was a direct way of economizing self expression, responsibility and interest.

Keeping Customers Out of Repair Shop

The repairman suggested the adoption of some scheme which would keep customers out of the repair shop where they are in the habit of interrupting work in progress. This developed a lively discussion of different ways to bring about such seclusion with suggestions as to what other dealers were doing. Arguments pro and con were heard, with the result that when the question was finally settled, each one was satisfied and understood just what conditions made the final decision necessary.

Loafing in the shop on the part of the younger members was berated and those concerned were warned of the consequences—the danger to their future and the danger to their job. The boys took the warning seriously and admitted the foolishness of such actions during working hours. The sober judgment of older men impressed them particularly when given in the spirit of helpful advice instead of a "bawling out" during working hours.

Some of the men had noticed the atmosphere of insubordination which is created by some of the shopmen calling

NOTICE

There will be an informal meeting of all sales and shop office men in the upper room tonight. We will discuss the things of interest to the success of the business and the welfare of the workers. Bring your ideas, suggestions, and criticisms for improvement with you. We want your advice—you want our help. Time: 7.30 o'clock.

his pay, in order to have as much time away from work to develop himself along lines that he really enjoys."

One essential thing needed therefore is interest in the work. A good indication of interest is the use of the mental powers and the development of the ability to see new methods and improvements. Such a channel is the organization meeting. That the meetings of this organization do much to promote self-expression and interest, is borne out by the fact that a large number of points are brought up and discussed.

Windows Needed Washing, Electricity Being Wasted

For instance, the employees noticed that electricity was being consumed needlessly in lighting the garage because the windows needed cleaning. This was called to the attention of those in charge at the meeting and during the following week the windows were cleaned, thereby admitting more light, obviating the need for as much current and augmenting the cleanly appearance of the building—in itself an asset. This may seem trivial, but it was a leak, and a "small leak may sink a big ship."

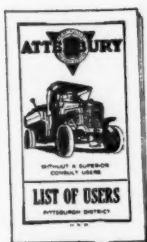
The tool problem was in need of attention. Valuable equipment was being lost and mislaid and much time was being wasted in seeking for needed tools because no system was being followed.

Someone would take a drill out of the block, use it in the drill press on the second floor and leave it in the press. When another shopman wanted the same size drill he wasted probably 15 minutes looking for it. Again one might find a big wrench lying on the garage



How Atterbury users are selling trucks for this Pittsburgh dealer—

One reason why the Atterbury Franchise is so valuable



"Don't take my word for the quality of the Atterbury truck," says the Pittsburgh salesman to his prospect. "Could the Atterbury have a list of users like this in Pittsburgh if it was anything short of 100%?"

—That is all the Pittsburgh Atterbury salesman has to say to a prospect to clinch a sale. A little book of users, published by the Pittsburgh

dealer, contains the names of nearly 200 Atterbury users—most of them started to show repeat orders. (All sold within less than two years.)

This is the way Atterbury users are lessening the sales resistance for every Atterbury dealer, and this is just one of many reasons why the Atterbury franchise is recognized as being very valuable. It will pay you to investigate.

ATTERBURY MOTOR CAR CO., Buffalo, N. Y.

ATTERBURY

MOTOR TRUCKS OF MAXIMUM SERVICE

a salesman or one of the members of the firm by his first name or by nickname.

Attention was called to the effect upon a prospect or customer of such commonplace intimacy between employer and employee during business hours, especially when a prospect was discussing a sale with one of the owners. It was pointed out by several of the men why a more respectful title should be employed in addressing men in the salesroom. Not that anyone wanted to be "Mister" but for the sake of prestige and its influence on sales, more respect was demanded of the shopmen when addressing one of the men in the salesroom or office.

A score or more additional things were brought up during the meeting. Such things as criticisms of the work of anyone during the week were discussed frankly without malice to anyone and the "sucker" spirit was absolutely tabooed. Nothing went outside of the meeting. Shop equipment needed and equipment for the convenience of the employee were suggested by the shopmen whose constant contact with the work made them particularly able to give reasonable suggestions.

This particular meeting was held during a campaign of Holley manifold sales. To give the salesmen some arguing points, one of the shopmen familiar with the construction and advantages of this manifold, gave a little educational talk. The business of the previous week and month was reviewed with figures for comparison with other local dealers. Favorable showing imbues all the men with a sense of increased pride in the organization of which they are a part and should there be any unfavorable showing, immediately the reasons and methods of correction of such can be discussed.

Salesmen Interchange Ideas and Cite Selling Experiences

The salesmen have a period in which the new experiences of the previous week are told. New arguments, or especially effective ones, are told for the benefit of the others and any selling problems that crop out are considered.

The sales manager reminds the men of the prizes awaiting those with the best showing and encourages increased effort, giving some suggestions.

The sincere spirit in which the men take part in the meetings is shown by the fact that several in charge of different parts of the business frankly asked for suggestions and criticisms from the other men who have a chance to view the workings of the departments through a different perspective and often see things that escape the attention of the one who is directly over the work.

Plans are made for securing prominent tradesmen and leaders in different branches of the industry to talk to the men on subjects of general interest in the trade and to keep them posted on new developments, and educate them to the inner workings of concerns whose products they handle.

Naturally, organization meetings must be very informal; that is, there must be no feeling of restraint. If you get the men together on an equal footing—like a little family with common interests—you will be surprised how many new visions grow as a result of the new relations between you and your employees, and how the new spirit of interest and responsibility and contentment boost your business.

How One Motor Truck Distributor is "Carrying On"

The A. L. Englander Company, of Cleveland, distributor for Acme trucks, is distinctly "going after business," as the following statement from O. L. Prior, general manager of the truck department, will show:

"We have recently organized the Truck Owners' Transport Company. One man secured the business, another man runs the office and looks after collections. Owners drive their own trucks and allow the office 10 per cent. for transacting the business and while the corporation has only about \$5000 paid in, yet it is a safe proposition because each man is vitally interested in the success of the company and is personally responsible for his truck. Work as secured is rotated among the members, except where companies ask for particular members or trucks with special bodies. It takes a real 'boss' to run the company and we are fortunate in securing the right man. He put up a truck and put up the money to make it a success and runs it with a strong yet absolutely impartial hand.

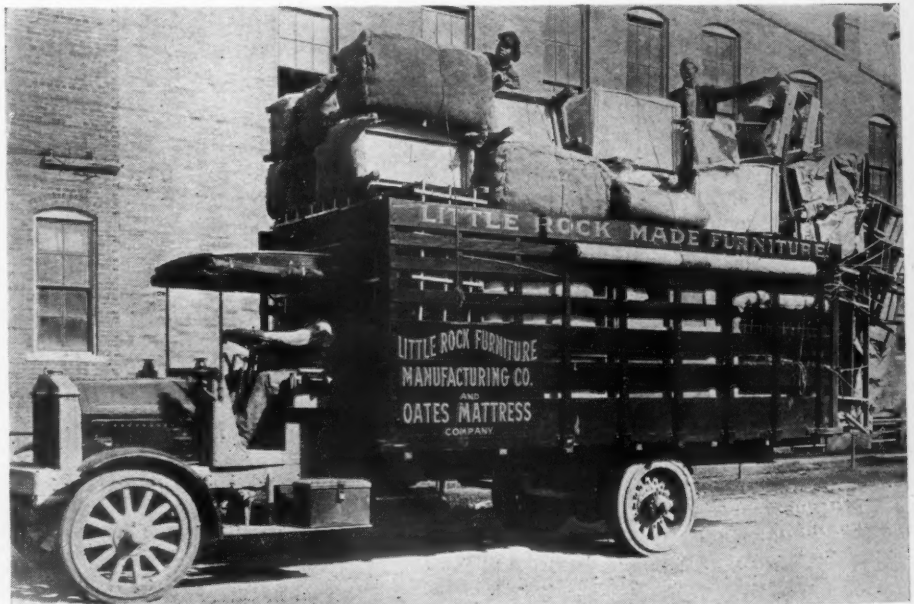
"The Clover Meadow Creamery Company has a fleet of Acme trucks now. This company was organized to fight the trust and is composed of 400 grocers. The milk is sold to these grocers at wholesale. The grocers in the past were at the mercy of the trust and were unable to make any profit on the handling of milk. The farmers in this part of the state were also at the mercy of the trust and this company is giving them real competition. They had a hard time getting started and we had as hard a time trying to sell the trust. We joined forces and took the milk company officials (whom we know) right out in the coun-

try among the farmers and sold the farmers the truck idea and our ability to bring the milk in daily. They gave us unofficial charge of their transportation problems and will consider nothing but our trucks backed by Englander Motor Company Service.

"To establish these rural express routes one must first find a milk dealer who will buy one complete load, then take that milk dealer and go over enough ground in the country on a paved road to secure

a maximum load. We start loads when we secure enough to guarantee 60 per cent. of rated load. We have six of these loads running, four of which bring in from \$900 to \$1000 per month per truck."

Federal Motors Finance Corp. has been organized in Detroit, with a capital of \$5,000,000. Detroit bankers, automotive men and attorneys are behind the company, which will give credit to purchasers of cars, trucks and tractors.



Looks Like a Case of Overloading; But It Isn't

Furniture receives some hard knocks during its lifetime, especially if the owners move from house to house very many times. But until the furniture is sold by the retail merchant and delivered to the customer, every piece must be handled with care. After that—well, it's up to the owner. That's why the transporting of furniture—often valuable and somewhat easily broken—is a problem. Then too, as it usually requires considerable space, yet is light in weight, another angle is brought into the transportation of the pieces. This three and a half ton Federal has solved the furniture transportation problem for the Little Rock Furniture Manufacturing Company of Little Rock, Arkansas. How many such loads do you think would fill a freight car?



Since 1899 **POLACK** TRUCK TIRES
World's Standard



What the
Polack Dealer Proposition
Offers You

1. An acknowledged **QUALITY** Truck Tire of **ESTABLISHED REPUTATION**—the oldest Standard Truck Tire in the world.
2. Complete line of **REGULAR** Type.
3. Complete line of **HIGH CROWN** Type.
4. Liberal opportunity for profit.
5. Liberal offer of Tire Press.
6. Assurance of permanent connection.
7. Intimate relationship directly with Headquarters.
8. Regular personal co-operation.
9. Liberal Sales Helps—based on long experience as Truck Tire Pioneer.
10. Specializing in Truck Tires and Truck Tire problems only.

Get your share of the big Truck Tire Business coming this spring.

To responsible dealers in open territory, we have an attractive proposition.

Write today for details.

POLACK TYRE & RUBBER CO.

1876 BROADWAY

NEW YORK

Metal and Rubber Markets

Steel Trade Accepts Lower Prices With Good Grace

The steel industry is accepting philosophically the price changes decided upon at the recent conference in Washington with Secretary Redfield. Orders are being received at the new prices. The question of the continuation of the reduced prices during the coming year is the occasion of a great deal of speculation. As the matter stands at present, it has been established that there will be no further recessions from the present rates, but some producers feel, that, with present high costs of production, there may be a later attempt to quote at higher figures, provided sufficient orders materialize to practically guarantee capacity production. The problem of wages is another point about which there is much discussion, particularly among high cost producers. It seems improbable that there will be any change in the wage scale for some time to come, as the Industrial Board is bending every effort to discourage any movement in this direction.

Steel Products Prices

Per ton, Pittsburgh—

Bessemer billets	\$38 50	a	....
Open hearth	38 50	a	....
Forging billets	51 00	a	....
Sheet bars	42 00	a	....

Sheets

The following prices are for 100-bundle lots and over f.o.b. mill:

Blue Annealed Sheets—

Pittsburgh	\$3 55	a	....
Philadelphia	3 79	a	....
Chicago	3 82	a	....
Galvanized Sheets of Black Sheet Gauge—			
Pittsburgh	\$5 70	a	....
Chicago	5 97	a	....
Tin—Mill Black Plate—			
Pittsburgh	\$4 35	a	....

Iron and Steel at Pittsburgh

Bessemer iron	\$29 35	a	....
Bessemer steel, f.o.b. Pitts...	38 50	a	....
Skelp, grooved, steel	2 45	a	....
Skelp, sheared, steel	2 65	a	....
Ferromanganese (70%)	150 00	a	....
Steel, melting scrap	14 00	a	....
Steel bars	2 35	a	....

COPPER.—The demand for copper is heavy at present and a sustained buying movement is expected to be characteristic of the market for some time to come.

There is little or no export demand, but it is expected that the situation will be cleared up upon the return of representatives of the copper combine who have been visiting European markets.

ALUMINUM.—Conditions in this market continue quiet. Prices range around 31c per pound for ingots, 98-99 per cent.

TUNGSTEN.—There is nothing to report in this market. Prices are nominal in the absence of any demand.

Prices of Finished Products

OTHER METAL PRODUCTS.—The following prices are current on brass and bronze items:

Copper sheets, hot rolled.....	22 50	a	....
Copper sheets, cold rolled	23 50	a	....

Copper bottoms	30 50	a	....
Seamless tubing, bronze.....	29 50	a	....
Cut lead sheets	8 25	a	....
Copper rods	19 25	a	....
Copper wire	17 25	a	18 00
High brass wire	18 75	a	....
High brass sheets	18 75	a	....
High brass rods	17 75	a	....
Low brass sheets	18 75	a	....
Low brass wire	18 75	a	....
Low brass rods	21 25	a	....
Brazed tubing, brass	29 50	a	....
Brazed tubing, bronze	33 50	a	....
Seamless tubing, brass	27 00	a	....
Seamless tubing, copper	28 00	a	....

Prices of Old Metals

Aluminum—	Buying.	Selling.
Cast scrap	16 a16½	17½a18
Sheet scrap	18½a19	19½a20
Clippings	16½a17	18 a18½
Copper—		
Heavy machinery comp.....	11½a12	12½a13
Heavy and wire	11½a12	12½a13
Light and bottoms	10 a10¼	10¾a11¼
Heavy, cut and crucible.....	12 a12½	13 a13½
Brass, heavy	6¾a 7	7¼a 7½
Brass, light	6 a 6½	6½a 6¾
No. 1 clean brass turn'gs ..	6 a 6¼	6½a 7
No. 1 comp. turnings.....	10 a10½	11 a11½
Lead, heavy	4¼a 4¾	4¾a4.87½
Zinc scrap	3½a 4	4¼a 4½
Black tin, scrap	50 a53	55 a58

Continued Dullness in Rubber Market

Buyers are not responding to the lower prices on plantation grades, and price concessions so far made have failed to draw orders. The depression in the market for spot and nearby plantation grades is most noticeable.

Crude Rubber Prices

Para—Up-river, fine, per lb....	55½a	56
Up-river, coarse	34 a	34½
Island, fine	47½a	48
Island, coarse	20 a	21
Caucho, ball, upper	33½a	34
Caucho, ball, lower .....	.. a	..
Cameta	*21 a	22
Plantation—First latex, pale		
crepe	51 a	..
Brown, crepe, thin, clean..	45 a	..
Smoked, ribbed, sheets.....	50 a	..
Centrals—Corinto	37 a	39
Esmeralda	37 a	39
Guayule, wet	30 a	..
Guayule, washed and dried.	40 a	..
Balata, sheets	90 a	..
Balata, block, Ciudad.....	.. a	75
Balata, block, Panama.....	55 a	60
Mexican—Scrap	39 a	..
Slab	32 a	..
African—Massai, red	55 a	..

* Nominal.

Scrap Rubber

Tires—Automobile	3¼a	..
Bicycles, pneumatic	3 a	..

Standards Bureau Plans Investigation of Lubricating Oil Situation

The Government has interested itself in the lubricating oil problem. A letter from Director S. W. Stratton, of the Bureau of Standards of the Department of Commerce at Washington, is accompanied by a ten-page typewritten outline of the program which has been prepared as a guide for the prosecution of a re-

search on lubricating oils, particularly for internal combustion engines. Those interested can secure copies from the director and are invited to give constructive criticisms and suggestions.

According to the letter, study should reveal what the present qualities of lubricating oils made from crude petroleum of different bases now are, and if a difference is found, to determine why it exists; whether, on the one hand, it is caused by the presence of undesirable compounds left in by manufacturing processes, or whether these differences are caused by inherent characteristics of certain groups of chemical compounds peculiar to petroleum of different bases.

The general purpose as outlined in the introduction of the program is to collect as much information as possible pertaining to the many problems involved in the lubrication of internal combustion engines. The secondary purpose is to determine the real value and importance of laboratory methods now used in oil testing and of the significance of the results as an indication of the value of oils in practical service.

Work on Forest Roads to Begin Soon

That the development of the national forest road systems is given great impetus by the terms of the Post Office Appropriation Act, which the President recently signed, is asserted by the Department of Agriculture. Besides increasing by \$200,000,000 the total fund available under the Federal Aid Road Act, the new law makes available for expenditure by the Secretary of Agriculture \$9,000,000 for roads and trails within or partly within the forests.

The law also authorizes the Secretary of War to transfer to the Secretary of Agriculture, material, equipment and supplies suitable for highway improvement and not needed by the War Department. Motor trucks come under this ruling. While most of this will be distributed among the highway commissions of the states for use on Federal aid road projects, an amount not to exceed 10 per cent. may be reserved by the Secretary of Agriculture for use in building national forest roads or other roads constructed under his direct supervision.

The \$9,000,000 fund may be used for maintenance as well as survey and construction. The new legislation, like the Federal Aid Road Act, authorizes the building of roads and trails necessary for the use and development of national forest resources or desirable for the proper administration, protection and improvement of any forest where co-operative local contributions can be obtained; but in addition it contains a new feature of much importance.

This new feature permits the Secretary of Agriculture, without the co-operation of local officials, to build and maintain "any road or trail within a national forest which he finds necessary for the proper administration, protection, and improvement of such forest, or which in his opinion is of national importance."



1,444,882,194 gallons of kerosene oil were consumed throughout the United States in 1918; the greater part of which went into individual homes; a striking example of the service motor trucks are rendering transportation in the wide-spread distribution of necessities.



INTERRUPTION AND DELAY of delivery schedules are serious matters.

HEAVY DUTY TRUCKS can hold to their schedules only when their tires are dependable.

FISK SOLID TIRES are built to wear—to meet the ever-changing road conditions.

THEY ARE DEPENDABLE. They do their part to keep the truck running on schedule. Next time—buy Fisk.

FISK TRUCK TIRES

Pneumatic-Tired Trucks Doing Good Work in Many Lines of Business

Transportation of Perishables and Breakables Offers Large Field. Speed is Big Factor in Many Instances. High Initial Cost Conditions. See Big Future for Giant Pneumatics

THE increasing use of pneumatic tires throughout on the heavier trucks deserves considerable attention in view of the effect such use will have on truck service in the future. In some instances, the design of many trucks will have to be somewhat changed to enable them to operate at the increased speed which the use of pneumatics makes possible and without sacrificing their capacity or engine efficiency.

Experience gained during the war had a considerable effect upon the development of the large pneumatic. Several of the large tire builders are offering, for heavy-duty trucks, a line of pneumatic tires that has gone through considerable testing and improvement, and has given very satisfactory use. There is little opposition to the assertion that the life of the truck is greatly lengthened and repairs are reduced by the use of pneumatics. The experience of truck operators with whom the writer has talked bears out this statement. As one operator put it: "The truck is the vital thing, and if you can save it by the use of more expensive equipment, you are on the right track."

12,800 Miles Without Repairs

The Knutsen Motor Trucking Co., Cleveland, O., is operating a 2-ton truck from the home city to Akron, with 40 x 8-in. pneumatics on the rear, and in 12,800 miles the truck has not been touched for repairs. Besides the decrease in repairs the trips can now be made in almost half the time, the trucks being driven at from 20 to 30 miles an hour. The trip from Cleveland to Akron, a distance of 42 miles, is accomplished in an hour and a half.

The chief advantage in the use of pneumatics, to a trucking company, is the greater speed obtained. Often a truck will make two trips, where it formerly made but one. In the case of the Knutsen company, a garage and service station that was maintained at Akron was eliminated because the trucks could make deliveries and return in ample time. Two trips in place of one in the same time means just so much increased earning power for the truck.

The great concern expressed by truck operators is that the tire may be punctured or blow out on the road 20 or 30 miles from town, and there would be a considerable loss of time in getting service and getting the truck running again. Those who are using big pneumatics carry a spare with them to take care of one mishap which, except under unusual conditions, is as much as will ever

be needed. The tires are so thick that punctures are few, and two on one run would be a radical exception. However, one of the tire companies, selling the Giant Pneumatic in Cleveland, maintains a service car which it uses in giving tire service to its users on the road. This is more of a preventive measure than a cure for any existing trouble.

Giving Good Mileage

The opinion has been expressed that the mileage on pneumatics is very low considering their cost. This is not true

cannot be operated at the higher speed with the full load without tearing the engine to pieces, and they have difficulty taking hills under load. If the feature of increased speed is prevented, because of the abilities of the truck, one of the biggest advantages of the pneumatic is destroyed.

E. A. Myers, of the E. A. Myers Co., of Pittsburgh, recently said: "We are now having considerable call for pneumatic tires on trucks, but as most trucks are now built it is difficult to show to many truck users wherein increased cost



Cleveland-Akron Bag Company's Pneumatic-Equipped White Truck on the Way to the Freight Station With a Heavy Load

if we can judge by the experience of several users, and the plans of the tire builders to guarantee a mileage from 12,000 to 15,000. The Brandt Co., Cleveland, O., has run one of its 38 x 7's, 15,000 miles, and expects an additional 5000 before the tire is useless. The Daisy Hill Farms has used a set of 40 x 8-in. pneumatics on its 2-ton milk truck since last September, and the tires have run 7500 miles in that time and show very little wear.

Will Trucks be Differently Constructed?

Are trucks, at present, so constructed that they are capable of operating at the increased speed permitted by the use of pneumatics? This is a question that many truck men ask and upon which various opinions are expressed. Prevalent belief is that some trucks can stand the increase in speed, from 12 or 14 miles an hour to 25, without any injurious effect to the engine or need for reducing the carrying capacity of the truck to enable greater speed. Others

is justified, except where the damage to the goods hauled is a factor.

"Without more power and provision for increased speed the user must now figure only on the saving in the cost of upkeep of the truck to pay for the difference in the cost of the tires. With a truck having more power and designed for increased speed, the greater profits due to increased earning capacity would be a real factor."

Mr. Myers further believes that pneumatic tire use will be limited until truck manufacturers furnish trucks with sufficient power and with a gear ratio that will enable the trucks to travel with a load at an increase of from 50 to 100 per cent. in speed. When this is done, Mr. Myers says, it is easy to figure out how the earning capacity of the truck with pneumatics can be increased on a very large per cent. of truck work, to more than justify the extra cost of the tires.

A distributor of a popular make of truck in one of the large cities in the middle west said he could not recom-

GUARANTY PLAN BANKING

EVERY progressive truck dealer maintains two banking connections.

One of these is properly with his local bank for current deposits and expenses.

The other should be with the strongest banking institution specializing in the discount of automobile paper.

A connection with such an institution gives the dealer a certainty of being able to finance his receivables irrespective of local money-market conditions.

Continental Guaranty Corporation, known until April 15th as Guaranty Securities Corporation, has the largest resources of any banking institution in the world devoting its exclusive attention to automobile financing.

Resources of over \$10,000,000.00, a strong organization, a clean-cut, four-square policy, and an abiding faith in the automobile industry have put the institution in the foremost place.

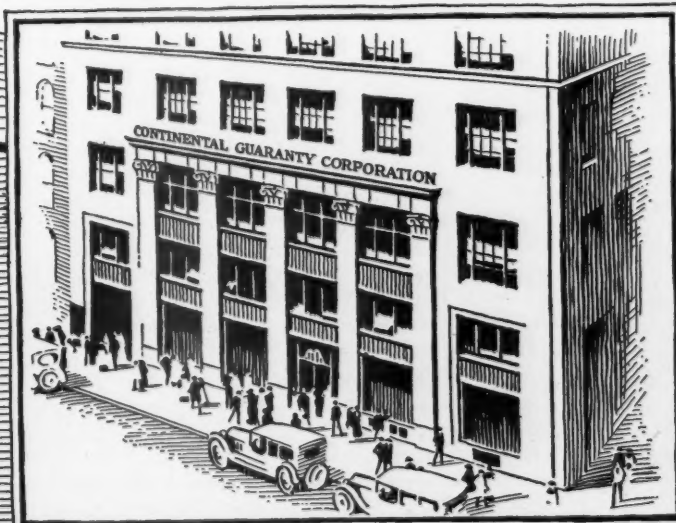
We solicit inquiries from responsible, well-rated merchants of trucks, who would like to discuss the matter of opening an account with us. Your inquiry places you under no obligation.

Continental Guaranty Corporation

Continental Guaranty Building New York City
San Francisco Montreal

Affiliated with Guaranty Banking Corporation
Continental and Commercial Bank Building, Chicago, Illinois

110,000 trucks and automobiles (worth over \$100,000,000) financed up to Nov. 30, 1918



mend the truck for work at 20 miles an hour, when it was built to run at but 12 or 14. It may mean a lighter, a stronger and a faster truck.

No Change in Service

Service on the larger pneumatics is the same as on the regular sizes. Larger molds are needed in vulcanizing, and some users may demand that service be given on the road. It is also necessary to carry a jack. The large pneumatic can be used on poorer roads than the

the trucks has been extended so that the earning power of each is now much greater and towns at a great distance from the big centers are given the advantage of the more satisfactory service.

Take the instance of the Daisy Hill Farms, which operate between the dairy 15 miles out of Cleveland, and the consumers in Cleveland. This company owns a 2-ton White, on the rear of which 40 x 8-in. pneumatics have been placed after operating for many months on solids. An average load contains 900



Firestone 44 x 10 Giant Cord Tires That Are Now Undergoing a Period of Testing in Northern Ohio

The front tires are 38 x 7 inch pneumatics

solids, as the work of several trucks around Cleveland proves, but provision must be made against delays on such roads, due to inability to change tires should one be punctured. As a hand pump is almost useless in inflating one of the large tires to 120 lb., a power-driven pump is required.

Pneumatics increase the radius of the truck operations as experienced by the Cleveland-Akron Bag Co., Cleveland, O. This concern has a fleet of Whites and Packards. All are equipped with pneumatics so that the territory can be covered in the quickest possible time. From Cleveland these trucks are sent to towns throughout northern Ohio; to the west beyond Sandusky; north to Norwalk, Savannah, and toward the south to Wooster, Canton, Alliance, Salem, Youngstown; and to the east as far as Conneaut. All the towns within this territory are covered. The trucks carry a crew of awning fitters, the driver and two others. While on the road these men are not working, and consequently the less time the truck is required to remain on the road the more work the men are able to give the company. The 2-ton Packards have 40 x 8-in. tires on the rear, and more than capacity loads are sometimes carried. Even with this overload, a speed of from 20 to 30 miles is maintained on the open road. One of the drivers asserted that the 2-ton White he drives often made as high as 35 miles an hour.

This company has had no trouble with the tires and is getting good mileage. They are saving a considerable sum each year in repairs and the time of the men sent out with the trucks to distant towns. This is an instance where the speed feature is the most important. Due to the speed, the radius of operation of

qts. of milk in bottles, in cases. These are transported from the dairy to Cleveland, and delivered to the consumer before 11 o'clock each morning. The truck is then used to do some general work around town and to take supplies back to the dairy.

The tires were put on to get away from the pounding and hard riding. C. A. Davidson, of the company, says that they can now take the truck through all kinds of roads, and that in the city on rainy days the traction is better.

Handling Breakables

The Dangler Stove Co., division of the American Stove Co., in Cleveland, uses 38 x 7-in. pneumatics on the rear of their 2-ton trucks that are used to deliver stoves and parts. These stoves are easily broken, and jarring must be eliminated if trucks are to be used in delivery. With the pneumatics the trucks ride very smoothly and the delivery superintendent says they are the only thing for the kind of work the trucks do. "Why do we use pneumatics?" he repeats, upon being questioned. "Well, stoves are breakable, that's the whole story."

On the farm, where the trucks are often required to operate in sand and light earth, better traction obtained with pneumatics enables the trucks to pull through the fields with a load.

Many dealers are of the opinion that truck operators will adopt the Giant Pneumatic in large numbers as soon as it has been proven to them that the tire is not an experiment, but a tested and proved product. Its use on trucks over 2 tons will come slowly until the truck owner has been educated to its feasibility.

The Motor Truck Serves in White Burley Tobacco Districts

The motor truck is doing the biggest service it has ever done in the burley tobacco fields of Southern Indiana, Ohio and Northern Kentucky. With the great demand for white burley tobacco and high prices offered, the element of transportation and quick transportation enters into the production. Big profits mean that the tobacco growers have the money to buy motor trucks.

The great sales warehouses in the burley tobacco district have been filled daily with loads hauled on trucks. The horse and wagon is still serving, but that service is rapidly being replaced by motor trucks.

The market at Madison, Ind., where there are several large warehouses, is indicative of the prosperity of these tobacco counties. With the exception of some tobacco which is brought to Madison by boat, the greater percentage is hauled by motor trucks.

All through this burley country the prediction is, that, with better roads, the motor truck will completely supplant the wagon as a carrier for burley.

The finer grades of this white burley have been selling as high as 75 cents a pound. Not a few years ago the members of the White Burley Society were advocating that the price of white burley be fixed at 15 cents a pound. Thus it may be seen how wealth has come to that section beyond the dreams of avarice; how it is that the farmers, the warehousemen and the buyers have reached the conclusion that the motor truck is the only sensible means of transporting this product.

The effect of the motor truck is felt in all the following tobacco markets: Georgetown, Ripley, Higginsport, Manchester, in Ohio, and Maysville, Augusta, Dover, Brooksville and Flemingsburg, in Kentucky, besides Madison, in Indiana, which is the most important tobacco center on the Indiana side of the river.

A single truck load of white burley is worth from \$1200 to \$1500. The marketing of last year's crop ends the latter part of March. Some of the best tobacco farms are owned and operated by women, and one authority states that one-fourth the sales of tobacco was from farms operated by women.

Lists of Books for Exporters

WASHINGTON, March 25.—Lists of books which should be valuable to the exporter have been compiled for the United States Shipping Board by the Free Public Library of Newark, N. J., by Miss M. L. Prevost under the direction of John Cotton Dana, librarian. These lists include a list of books on world trade, a list of books on ships, commerce and the merchant marine, a list of books on foreign countries and a list of books on foreign languages.

Sewell Cushion Wheels



Don't Blame the Truck
Equip with Sewell Wheels

MEETING THE DEMAND FOR MORE RESILIENCY AND MORE SPEED

A motor truck is an investment and its value is based on the net result—profit—which depends on how long a truck will last, and the cost of upkeep.

Motor truck manufacturers, their engineers and dealers encourage every feature in design, construction and equipment to overcome the effect of vibration. All trucks, no matter how good they may be, are subject to this destructive element

that causes unnecessary depreciation and dissatisfaction.

Sewell Cushion Wheels help keep motor trucks in service, and out of the repair shop, which increase profits—build good will—and lay a solid foundation for future business—repeat orders.

OVER 26,000 SEWELL WHEELS NOW IN USE

Installation made without expense to manufacturer or dealer



Keeping a customer sold—A sales policy that pays

BRANCHES:

Baltimore, Md.	Dallas, Texas
Boston, Mass.	Detroit, Mich.
Buffalo, N. Y.	Indianapolis, Ind.
Chicago, Ill.	Jacksonville, Fla.
Cincinnati, Ohio	Kansas City, Mo.
Cleveland, Ohio	Los Angeles, Cal.
Columbus, Ohio	

BRANCHES:

Louisville, Ky.	Philadelphia, Pa.
Milwaukee, Wis.	Pittsburgh, Pa.
Minneapolis, Minn.	Rochester, N. Y.
Newark, N. J.	San Francisco, Cal.
New Orleans, La.	Seattle, Wash.
New York, N. Y.	Springfield, Mass.
	St. Louis, Mo.

Sewell Cushion Wheel Company
Main Office and Factory: Detroit, Michigan

How One Wideawake Dealer Sold a Seemingly Hard Prospect

It is up to the Aggressive Dealer to Analyze His Prospect's Hauling Problems and to Show Why Trucks Will Save Him Money

By C. P. SHATTUCK

THIS is a story of how a New England transportation company released fifteen freight cars daily to the Government, and of how a motor truck dealer sold the company, which had found horse power satisfactory and profitable, its first motor trucks and later orders for additional machines.

For 40 years the name of Morse has been associated with teaming and expressing in Brockton, Mass. Starting with a few horses the business grew slowly but steadily. The love of the horse had been handed down from father to son, and salesman of motor truck dealers and even the dealers themselves made little, if any, progress in trying to convert the head of the Morses to the automobile.

But there was one dealer in Brockton who was a real salesman. His theory was that the ultimately successful dealer would be the man who sold transportation; who would sell his prospect a truck adapted to the work after the conditions under which the truck was to operate, had been determined through exhaustive study. This dealer also believed that, if he were to obtain further orders, in addition to seeing that the trucks were always dependable through service, he should co-operate with the owner in increasing their efficiency by a surveillance of routing, loading, garaging, selection of drivers, etc.

There will be some who say that the time and expense involved in such a practice is not warranted, that a dealer is justified in such a procedure only when

there is a known possibility of future sales. This contention is not tenable however, for in this instance the company had at one time bought a high grade truck and would have purchased others had its use been intelligently directed.

The dealer who was successful in selling the trucks and directing their use is A. M. Burgess, the White representative, who received an intensive training in transportation through his connection with the Brockton Heel Co., large users of White trucks. A description of their equipment appeared in the December issue of the COMMERCIAL CAR JOURNAL.

What the Analysis Revealed

An analysis of the transportation methods of the Brockton Transportation Company disclosed several interesting features. It was revealed that the company maintained an express freight service between Brockton and Boston and that, under normal conditions, 15 freight cars were required to handle the business. It was a form of shuttle service; that is, eight cars were loaded in Brockton for Boston and seven or more in Boston for Brockton.

The freight was of a mixed nature and comprised finished and raw material, but chiefly that utilized by shoe manufacturers. The freight and express matter was picked up both in Boston and Brockton by horse drawn equipment, the company maintaining 90 teams for this work as well as for delivery.

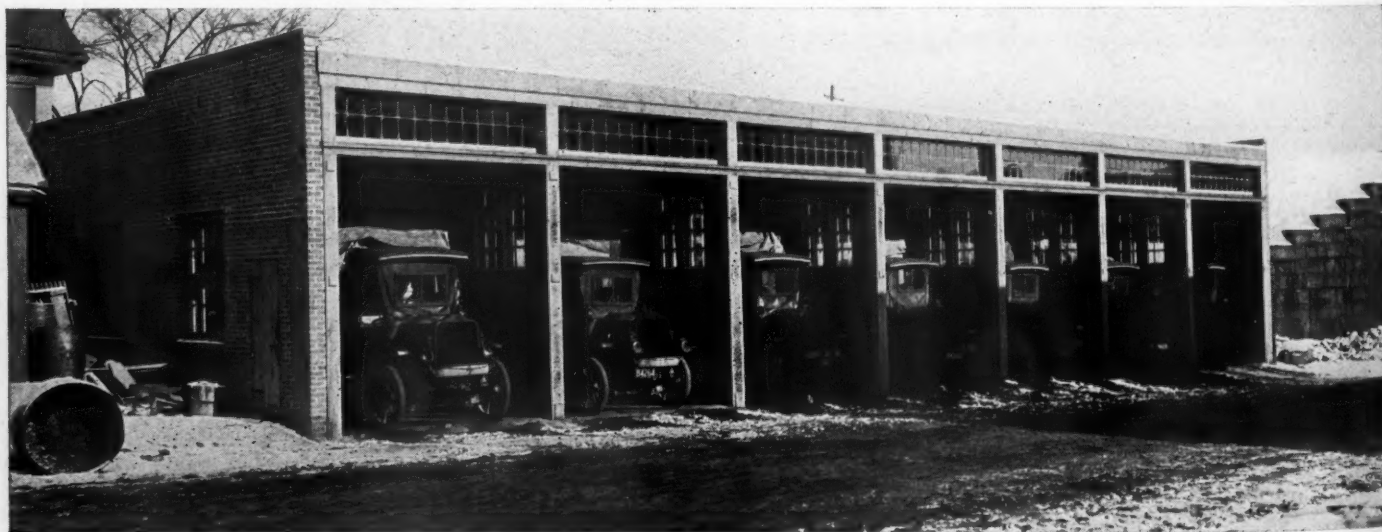
The investigator found that shipping by rail meant frequent rehandling. This

was especially true when it was necessary to transfer to other carriers or when the consignment was to a factory branch or store. Under these conditions it meant picking up by horse, unloading at the freight platform, loading in the freight car, unloading at Boston, loading on a team and unloading at place of shipment—approximately six operations which consumed considerable time to say nothing of the delays attendant upon the use of the railroad and also of the horses.

Data was obtained as to costs of handling, shipping and delivering the goods, time consumed, territory served and the maximum loads possible with the horse-drawn and rail equipment. It was also found that, when special shipments were made to such places as Lynn, Haverhill, Salem, Marlboro, etc., the service was expensive to the consignor and consignee, as well as pregnant with delays.

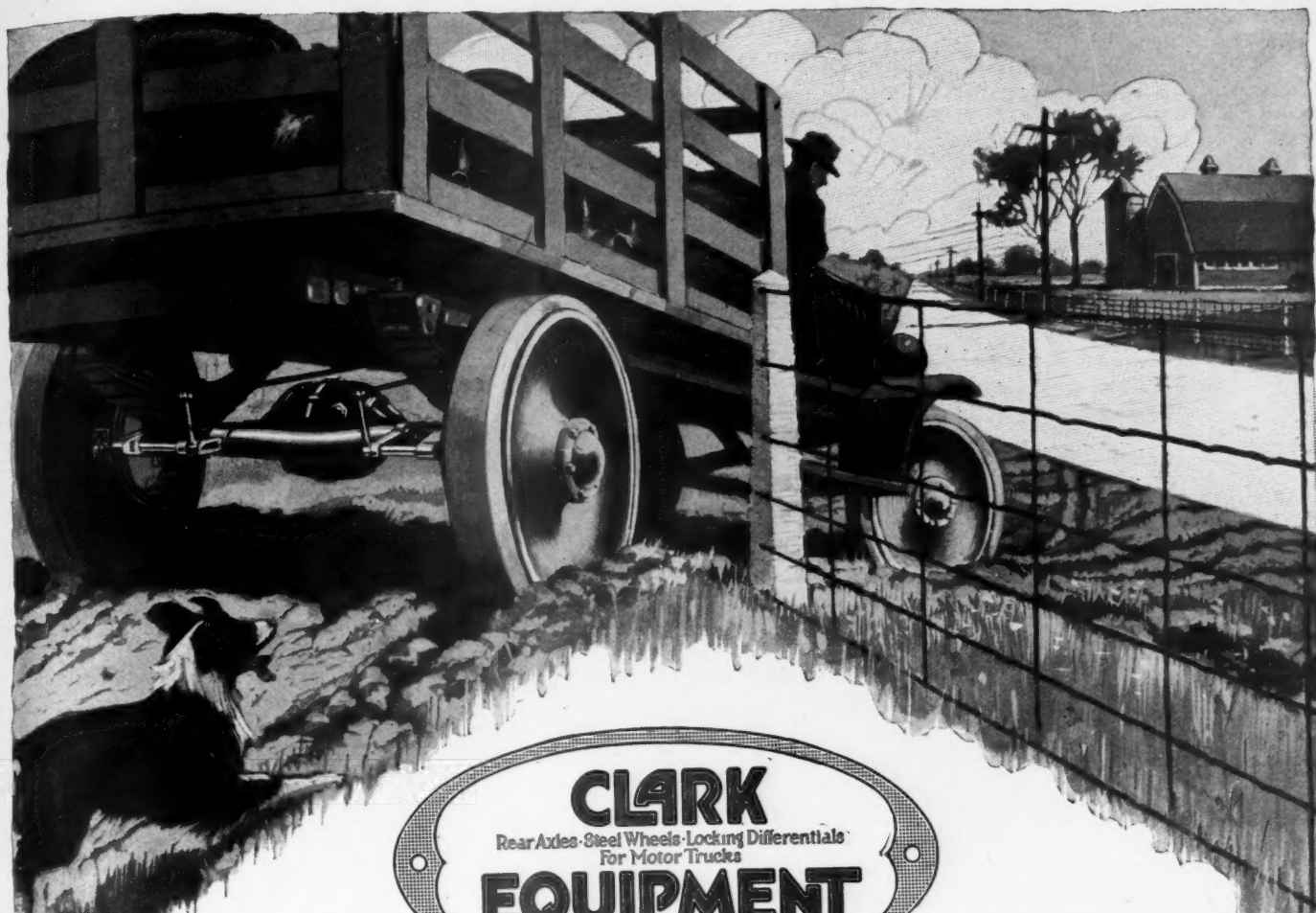
Embargoes Have Their Effect

With facts and figures, including truck operating and maintenance costs, the White dealer approached his prospect, who at first could not see how trucks could be profitably employed, and how they could compete with the rail haul rates. When the dealer outlined his plan, presented his analysis of the transportation of the company, and substantiated his findings with cost figures, H. G. Morse, general manager of the company, was sold. Embargoes and rumors of advances in freight rates had their influence, but it was the transportation plan that sold the first two trucks.



Truck Side of the Garage, Showing Individual Space for Trucks

The trucks are backed into position and loaded with outgoing freight. The construction of the building provides for garage, loading platforms and offices



CLARK
Rear Axles · Steel Wheels · Locking Differentials
For Motor Trucks
EQUIPMENT

Clark Disc Steel Wheels Give Long Life to Trucks

Good or bad roads have no terrors for Clark Equipped Trucks. Clark Disc Steel Wheels will outwear any truck; they require no attention.

Clark Axles give 12 to 14 inches road clearance.

Clark Equipment is Found Only on Good Motor Trucks

CLARK EQUIPMENT COMPANY
BUCHANAN — MICHIGAN

These were two 5-ton White chassis which were equipped with a van type of body and tarpaulins. The plan provided their replacing the freight cars in the haul between Boston and Brockton and return, a distance of 23 miles. The trucks were placed in operation in June, and up to December, when their effi-

the trucks coming from the garage, which was some distance from the freight house. Then there was lack of office room, which meant time lost between offices and freight house.

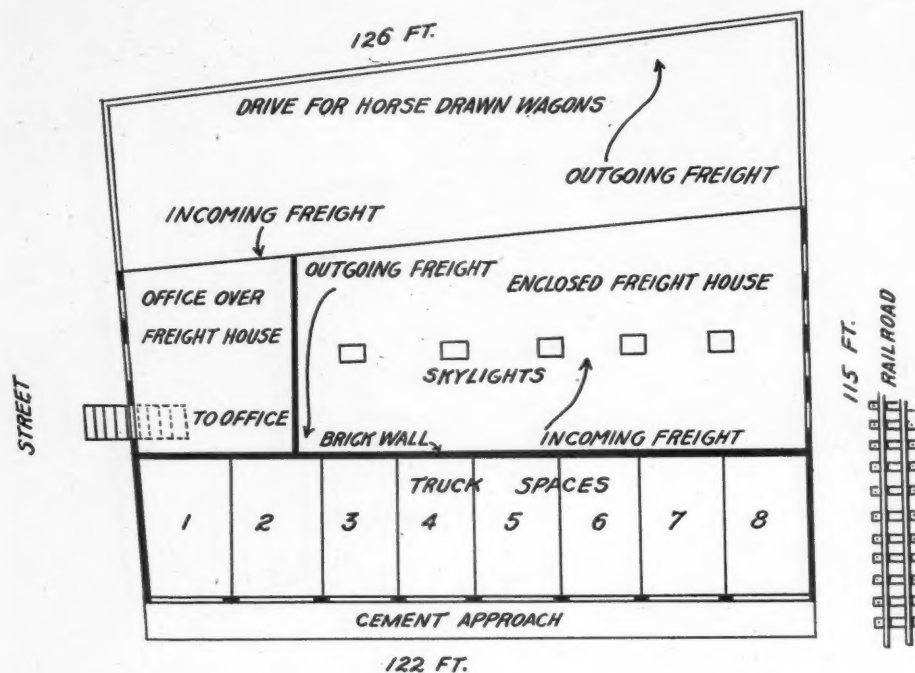
It is said that the railroad official did not endorse the plan of using trucks and, according to Manager Morse, he left

The plan, which is shown herewith, consisted of utilizing a lot of land with two of its sides facing streets and adjacent to the railroad, and erecting on it the structure referred to. The center of the building is an enclosed freight house, 122 x 45 ft., a one-story affair well lighted by skylights in the roof. At one end are located the offices which are built over the freight house, but communicate with the latter.

The plan provides for handling incoming and outgoing freight and for separating the motor trucks and horse-drawn equipment, horses being still used to collect and deliver on short hauls. The floor or platform of the freight house is of such height as to make easy handling of the freight on the truck side and on the horse side.

The truck side or garage is 122 ft. in length and there are eight individual spaces for trucks and these are numbered. The floor is of cement, the approaches to the platform are sufficiently wide to make easy backing of the truck and work around it if necessary, and leading from the street to the entrances is a cement approach, of sufficient pitch to drain all water. Easily operated doors permit enclosing all spaces.

The need of the old freight and of the 15 or more freight cars daily is eliminated by the trucks and building. The trucks are backed into position and loaded at certain spaces with outgoing freight and similarly bring in incoming goods. Outgoing freight can be loaded at night, when necessary, as the trucks are stored in their spaces. This saves the time generally lost where a truck has to make a run from its garage to a terminal when starting the day's work. With the plan outlined the driver begins his day's work by making a trip to Boston or other point of destination. At the Boston end, however, the driver assists



STREET OR PORTER'S PASS

Showing How a Combined Freight House, With Separate Platforms for the Trucks and Horse-Drawn Equipment, and Use of the Spaces for Trucks as a Garage, Speeds up Handling of Freight

ciency was greatly increased by new loading methods, shuttled back and forth from Brockton to Boston.

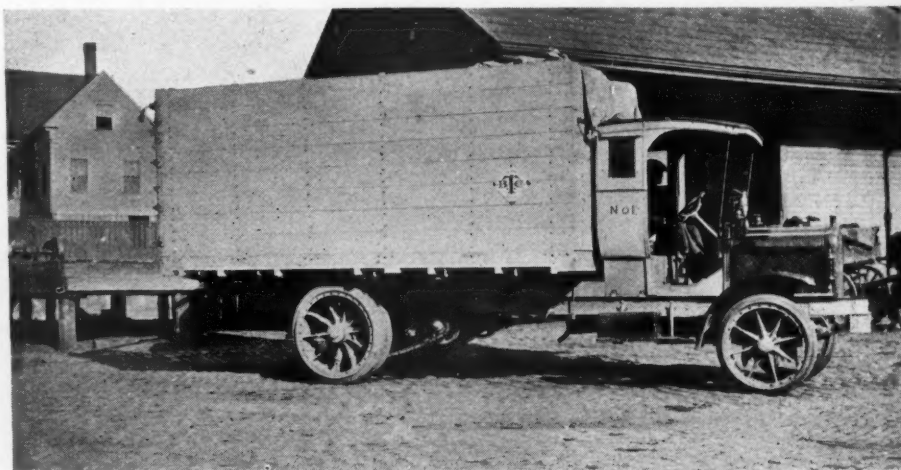
What the Trucks Accomplished

The practicability and economy of the plan was made apparent shortly after the trucks were placed in operation. The hours and sometimes days of delays incurred through the use of freight cars and embargoes were reduced to two hours, the trucks making the distance in that time. Inasmuch as the trucks largely eliminated two handlings by delivering direct (store door delivery) to railroads and steamship lines, it made possible greatly reducing the number of horses and freight handlers at both ends of the route. A repeat order of five trucks was the logical result.

How the Railroad Lost Out

At the time the first two machines were placed in service the company had a lease on an old freight building owned by the railroad and a spur track led to the building. In common with freight terminals of this type it did not make for rapid or convenient handling of freight, and the workmen were handicapped in stormy and cold weather. It had the additional disadvantage of handling incoming and outgoing freight through the same doors and platform, which meant frequent delays to the freight. It meant that time was lost by

no stone unturned to handicap the company. Like others, who are no farsighted enough to realize that the motor truck is an aid to the railroad, not a competitor, this railroad official unconsciously became the instrument of the



One of the Fleet of Seven Five-Ton White Trucks, Replacing Fifteen Freight Cars, in Service With Brockton Transportation Company

Each of these trucks are hauling twenty-five tons daily, and at less cost than by rail. In the background is the freight terminal, the disadvantages of which led to the erection of an up-to-date building, especially adapted to trucks

truck dealer who had formulated plans for combining under one roof a freight terminal with loading platforms, garage and offices.

in unloading and loading as he does ordinarily at the Brockton terminal.

The arrangement of the building permits rapid flow of the freight by assign-



HOFFMAN PROCESS

Before the First Operation

Correct manufacturing methods and complete equipment only partially constitute the requisites for the manufacture of high-quality steel balls.

Before a lot of steel is fabricated into Hoover Steel Balls it must first measure up to definite quality standards.

In no other ball manufacturing plant are to be found such complete laboratories as form an integral part of the great Hoover plant. Their functions are widely diversified and of the greatest importance, for no ball possibly can exceed the quality of the very steel that enters into it.

All Hoover steel balls are made from the same quality of special chrome alloy. There is but one standard, so thoroughly fixed that the rigid tests of the Hoover laboratories positively establish the fitness of the steel before manufacturing is begun.

Science underlies the making of Hoover Steel Balls from the moment the raw steel is received until the finished balls are shipped.

Hoover Steel Balls have won worldwide recognition for their superior qualities of accuracy, finish and resistance to wear and shocks.

Obviously, the complete Hoover laboratories, by rigid tests and inspections, guarantee the maintenance of the high quality of Hoover Balls.



Rigid examination and supervision of the materials which enter Hoover Steel Balls insure uniformity of quality. This photograph shows a corner in the chemical laboratory.

Hoffman Process

The Hoover Steel Ball Company is one of only three ball manufactories in the world with rights to use the Hoffman Process. It is universally recognized as the most advanced method for the uniform production of highest finished steel balls. It replaces human inaccuracy with automatic precision to .0001 inch.

The ability of this company to meet all shipping specifications is one other reason for the general adoption of Hoover Steel Balls.

Hoover Steel Ball Company
Ann Arbor, Michigan

HOOVER

STEEL BALLS

ing as many spaces on the truck platform and horse platform as may be necessary to handle the volume of business; that is, spaces 5 to 8 can be employed for incoming truck freight, moved across the platform to the outgoing platform to the horses. The goods brought in by the horses can be similarly handled by truck spaces from 1 to 4. Sorting the goods for delivery is a detail. In no way do horses, trucks or drivers conflict.

Care was used in the selection of the drivers and a bonus system is employed. The men are hired on the basis of a round trip a day and paid well. They are privileged to make additional trips, an opportunity they do not overlook. Practically every driver makes two round trips to Boston and return and frequently some will make three.

The average time required to make the one-way trip is two hours, that for loading from 30 to 45 minutes. So it will be seen that the drivers have no regard for union hours, as they work approximately

10 hours a day, making two round trips and longer when three are made. Of course there are special trips to be made, and these are paid for on a similar basis. The result of this method of compensation has, thus far, proven very satisfactory, particularly for the company, as it greatly increases the tonnage. While it would appear that the bonus plan might encourage the drivers to speed and result in rapid deterioration of the truck, the reader is reminded that two hours are used in making 23 miles, or an average speed of less than 12 m.p.h. Inasmuch as the trucks are under the watchful care of a man who knows the characteristics of drivers, their shortcomings, and when a truck is not being operated properly, any abuse is quickly seen.

Service is provided by the White agent and the trucks are periodically inspected. The service plan provides for keeping the truck in constant, dependable service by giving attention to the small details which, if neglected, gener-

ally mean large repair bills and loss of the service of the machine.

At the time the writer visited Brockton last November, the seven trucks were hauling between 175 and 200 tons daily, or 25 tons each, at the minimum figure. The best previous record with freight cars and horse-drawn equipment was 100 tons, the capacity of the horses. At that time the freight rate to Boston, ton lots, was 25½ cents the 100 and to this was added a teaming charge at each end of 7½ cents, or a total cost to the shipper of 33 cents. The Brockton Transportation Co. is hauling with trucks for 20 cents the 100 and is making a profit.

The truck dealer who can analyze his prospect's business, sell him the right truck for the work, and then seek to constantly improve the efficiency of the transportation, is going to sell more trucks to that user and others. Such service is the best selling argument the dealer can bring to bear upon the prospect who has failed to respond.

Co-operative Delivery Plan Has Its Disadvantages

Still Need for a System That Does Not Permit Loopholes

FOR some years Detroit has had a Retail Grocers' Association, which was largely a social organization, although a certain amount of attention was given to business problems. Recently, however, the rapid upbuilding of chain stores, with their disheartening competition, has injected new life into the Retail Grocers' Association, and has led to the formation of the United Grocers' Corporation. The details of this organization have slight part in a story dealing chiefly with transportation methods. Suffice it to summarize briefly by saying that the membership is divided into two classes—those who pay an initiation fee of \$50, and to whom goods are sold C. O. D., and merchants who take \$250 worth of stock in the Superior Wholesale Grocery Company, the co-operative body, and who are allowed credit to the extent of their stock holdings.

There are approximately 300 participants in the co-operative plan that permits of buying in great quantities and thus helping to meet the competition of the chain stores, with their highly systematized purchasing organizations and their facilities for efficient merchandising on a narrow margin of profits. This membership covers the entire city, although care is taken not to have two dealers close enough together so that there would be active competition, whereby the benefits arising from participation in the organization would be spoiled for both. At the same time there is a long list of applicants that serves as a means of disciplining and keeping in line grocers who might elect to buy a part of their stock through the association, where they were obliged to pay cash, and obtain the rest from jobbers, where credit would be extended, thus in

a measure nullifying the purposes of the organization.

The Superior Wholesale Grocery, of which William J. Cusick is president, officiating in the same capacity for the Retail Grocers' Association, maintains warehouses at 1161 Bellevue Ave., on the east side of the city, where there are ample railroad facilities right at the door. It is the expectation to shortly open a warehouse on the west side, and eventually operate a central cold storage plant to handle surplus stocks of dairy products, fruits and vegetables, which would aid materially in meeting competition.

At present the method of delivery is optional with members of the company. A grocer may pick up his own purchases at the warehouse, or he can have them delivered by one of the company's trucks. In the latter case one per cent. is added to the purchase price to cover the cartage, a sum that has been found just about sufficient to meet the cost of operation, maintenance and depreciation. Daily deliveries are made to points ten miles distant from the warehouse, orders being telephoned in the night before, so that the trucks get away with their first load early in the morning.

As nearly as possible a fixed schedule is adhered to, although with three hundred grocers whose daily wants vary greatly, the impossibility of determining in advance the exact requirements becomes apparent. Not all the grocers ask for daily shipments. It may be that a few small parcels suffice for one on a given day, and another's wants go far toward filling a truck, while the next trip involves fluctuations that completely upset the tentative schedule. This causes the mileage to vary considerably, and, also consumption of oil and gasoline, although a careful record is kept of truck

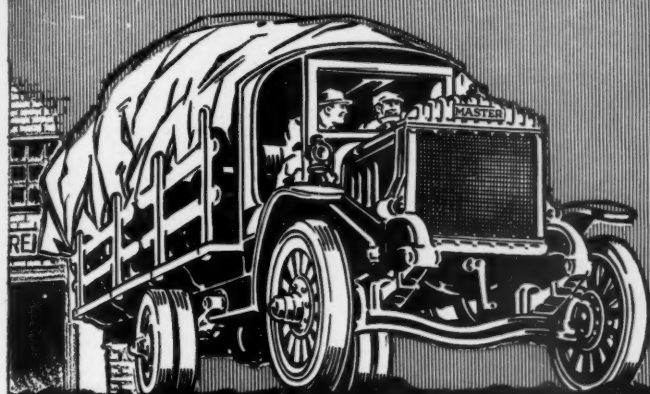
No minimum basis of shipments has been fixed, and, probably because of the co-operative nature of the plan, there has been little inclination to abuse this privilege by ordering quantities that obviously could not be delivered at the rate charged without a loss.

The charge of one per cent. is so low in the face of the saving effected through quantity buying that it would naturally be expected that the privilege would be taken advantage of generally. But in the delivery of groceries, as well as in every other line, the unbeatable system has yet to be devised.

The great bulk of shipment is handled by the grocers themselves, in their own delivery trucks and wagons, which is permissible under the optional plan. However, it did not take long to discover that in some quarters there was a tendency to put one over on the company, the exposure of which may serve as a warning to similar systems elsewhere.

"We find that some dealers will drive over to the warehouse themselves or send one of their machines for a bill of goods that is not bulky but runs into money," said President Cusick, to the COMMERCIAL CAR JOURNAL representative. "Suppose, for example, that a man buys \$150 worth of spices or of something else that is not particularly heavy. By delivering it himself he saves \$1.50—the one per cent. we levy to cover the cartage. But if this same man wants a barrel of vinegar and a barrel of salt, aggregate cost in the neighborhood of \$17, he will ask us to deliver it. We charge him 17 cents, and lose money on the transaction. These instances are not numerous, but they crop out often enough to show the possibilities. It is probable that eventually we will require members to state at the outset whether

balanced oversize



Means *Each Part Plays the Biggest Part*

*Frames, wheels and engine
may stand the strain, but is
every other part balanced to
take its share of the load?*

THE Balanced Oversize construction of Master Trucks has been developed by the practical needs of operation. It provides for no one outstanding feature of gigantic strength. It is the scientific balance of material with need—need with material.

Every part of every Master Truck is of proper relative strength. No one oversize part is called on to bear more than its just share of the load—no one usual size part is overtaxed by the strength possibilities of a few oversize parts. All parts are of oversize—balanced oversize.

Balanced Oversize is a definite, tangible point that *means* something. You can talk it "and prove it" to your customers!

Thousands of cost records are daily proving its worth. You can be making in your territory the profit that comes from selling the Master. Write NOW to learn whether your territory is open.

Ten Models. Six Sizes. 1½ to 6 tons.

Master Trucks, Inc.
CHICAGO

MASTER TRUCKS



MASTER OF THE LOAD ON ANY ROAD

they propose making their own deliveries or having us do it for them. The strict adherence to the agreement would do away with the present abuses."

Two Federal trucks are busy all the time, and it is planned to increase the equipment to keep pace with the constantly growing membership. The trucks make two trips daily. While there is bound to be a great fluctuation in the value of loads, the average earning power of a truck on the one per cent. basis is \$20 daily, on two loads. This is said to be sufficient to cover all expenses.

Drivers are paid a weekly wage instead of on a trip basis. They are required to keep their trucks supplied with oil and grease, and to make any minor repairs. Only one man is sent out on a truck, loading being attended to by warehouse employees, if assistance is required along the line it is furnished by the grocer.

Another interesting phase of the system that argues in favor of an understanding at the outset, in regard to shipments, is disclosed in the seasonal fluctuations and the effect of the weather. In summer much of the delivery is

handled by the grocers direct. Let a rainy day come along, however, and the truck tonnage soars, because the dealer prefers to pay the one per cent. rather than venture out. By the same token, the demands are much heavier in winter, when the going is heavy. Much of this, of course, could be obviated, and the truck schedule would come much nearer standardization, under the plan suggested by President Cusick.

However, the system has proved very satisfactory as a whole, and the near future promises to see it amplified.

A State's Most Valuable Asset

By CHAS. M. SMYTH

THE roads and highways of a state may be made its most valuable asset, or they may be allowed to become a troublesome and expensive burden.

For what do a state's most productive farming areas amount to, or its mining or mineral advantages avail, if the roads and highways over which the products of these industries are transported remain in such shape that it becomes prohibitively expensive to carry these products from their points of production to points of consumption?

It is impossible for the farmer to consume all that he produces upon his land. Likewise the man employed in the city cannot produce in his back yard all that he requires to eat and wear. The space intervening between these points of production and consumption is of varying degree and radiates in all directions from either point. For that reason it is quite impossible for railroads to reach out to each and every point of agricultural or mineral production.

Notwithstanding the advent of the airplane, the human being is still compelled to travel on terra firma with his pack,

consequently there is no place of production which has not its bypath or highway leading to its gateway. The automobile truck has increased the carrying ability of man to an immeasurable degree over his former beasts of burden, but under the former condition of his beaten paths, which in many instances are yet little improved, the costs of carrying have been proportionately increased. The producer cannot expect consumption to maintain under the increased costs. The consumer will starve with crops rotting on the farms if the producer cannot transport his products to points of consumption and dispose of them at a fair profit.

The modern and efficient methods of transportation will avail nothing if the highways are impassable to these vehicles. So the burden of upkeep falls mutually to both producer and consumer. Each individual in either class must co-operate in this effort or become a parasite upon his brother to that extent. Thus it is an easy matter to see that the highways of any state may be made its most valued asset.

Here in Colorado the residents of the state have awakened to this realization

perhaps as thoroughly as those of any state, and vastly more so than in many other sister states.

Colorado is blessed with a variation of advantages enjoyed by few other states. Her scenic attractions are incomparable. Her agricultural advantages, while not so extensive, are excelled by none. Her mineral advantages are unlimited and still in their embryo.

A high authority classifies Colorado as the ninth state in improved highways. She was the 38th state to enter the Union, which gives a good comparison of Colorado's age with that of other states, and illustrates the phenomenally rapid progress she has made. With what Colorado has already done, and with the added efforts now under way, the time is not distant when she will take first rank in this respect.

Motor Transport Day Proved Highly Educational

Colorado was the first state in the whole Union to inaugurate a Motor Transport Day, and the results of the efforts of the Highways Transport Committee of the Council of National Defense on that day and subsequently, have



View Showing Concrete Subway and Curve Where the Roadway Crosses Beneath the Burlington Railroad



View From the Point Where the Concrete Roadway Crosses Beneath the Burlington Track, Looking up the Grade to Where It Crosses Over the Union Pacific



THE big 'NOBBY CORD' was just "naturally" adopted by far-sighted, intelligent fleet owners as the only solution to heavy-hauling—with speed.

As ideal truck equipment, 'NOBBY CORD' PNEUMATIC TRUCK TIRES, have attained a permanent success, by increasing the speed, adding new life and cushioning the load of the truck.

Stock a good proposition with a big demand.

United States Tires
are Good Tires



awakened the people of the state to a realization of highway needs undreamed of by the most optimistic member of the committee. Advantages of the motor transport in all its phases are now comprehensive to all residents of the state, and keen interest and co-operation is manifest.

Sweeping increases in highway appropriations by counties over the state, which will result in good roads development on a scale not previously realized, are forecast by officials of the state highway department, because of this state-wide educational campaign. From the exchange of numerous letters and telegrams with Washington highway officials since the end of the war, comes the evidence that these national highway officials are preparing a nation-wide road building program, to provide work for returning soldiers and, coincidentally, to provide adequate highway facilities for the movement of food-stuffs by motor truck to the shipping points, thus opening the American markets to Europe for the relief of the starving peoples there.

Questions sent out by the United States office of public roads asking the Colorado departments how much money could be expended on roads this year in this state, together with the possible number of men who could be used on the work, were answered by T. J. Ehr-

hart, highway commissioner, with the statement that \$500,000 additional funds could be used and that employment could be furnished for 2000 men.

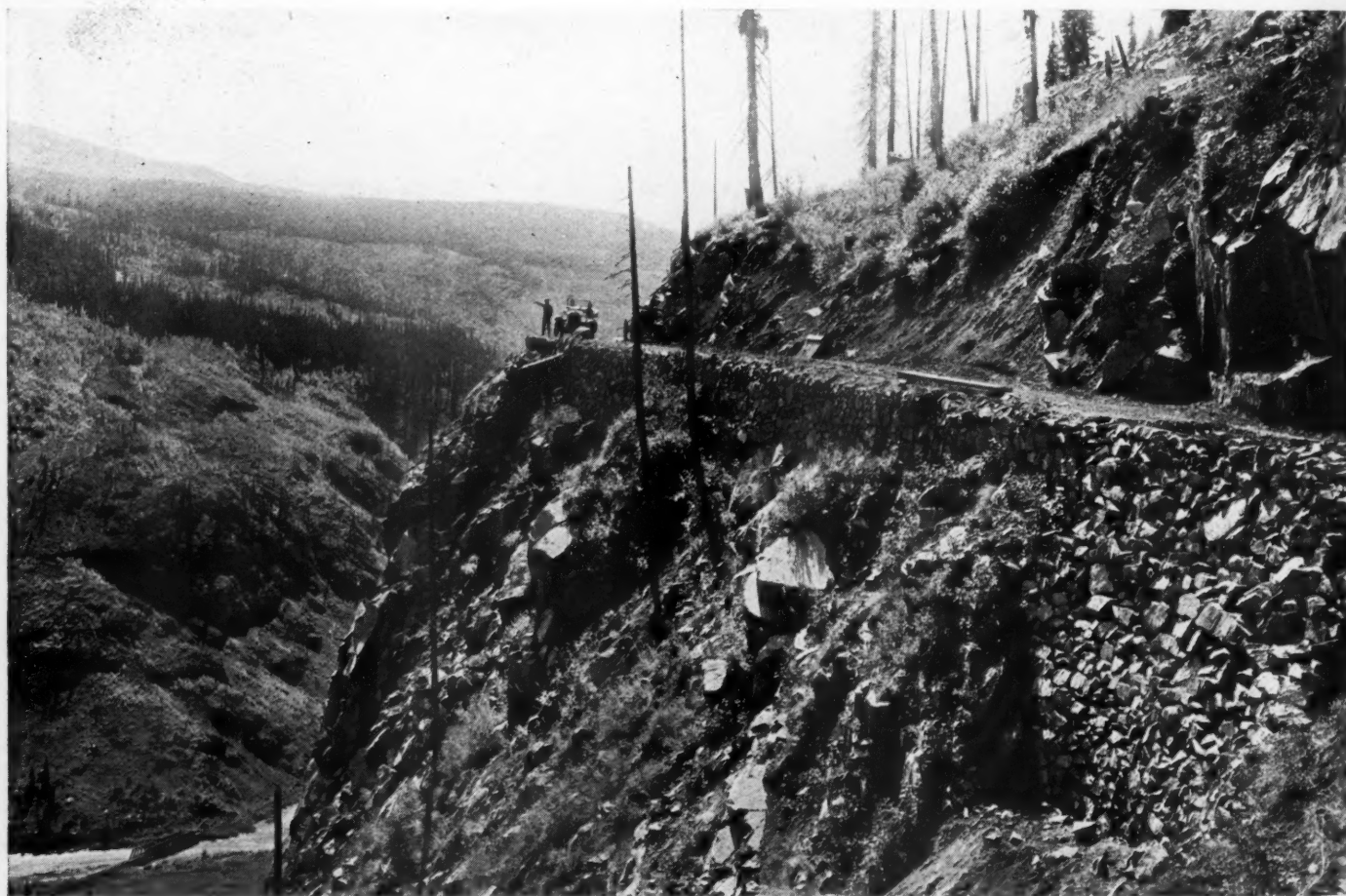
The budget for 1919 of the Colorado state highway commission, recently made public, authorizes the expenditure of more than \$1,000,000 on highway construction and improvement throughout the state. The passage of the Federal Aid Road Act will permit the Government to contribute \$21,602,000 to state highway commissions for assistance in road building. With the fund derived from Colorado's portion of this assistance, amounting to \$320,819.83, the sum of well over a million dollars is assured for expenditure in the state this year, and if plans of state legislators carry there will be many times that amount expended.

The Colorado state legislature is anticipating the voting of a heavy bond issue for construction and improvement of roads in Colorado. The State Highways and Transport Committee and civic organizations have determined that instead of asking for \$10,000,000 they will ask for \$20,000,000. The latter sum should easily be forthcoming, since the people of the state are awakened to the realization of the grand advantages and inherent economies of perfect highways. Even then Colorado is below what some states are doing this year. Illinois is

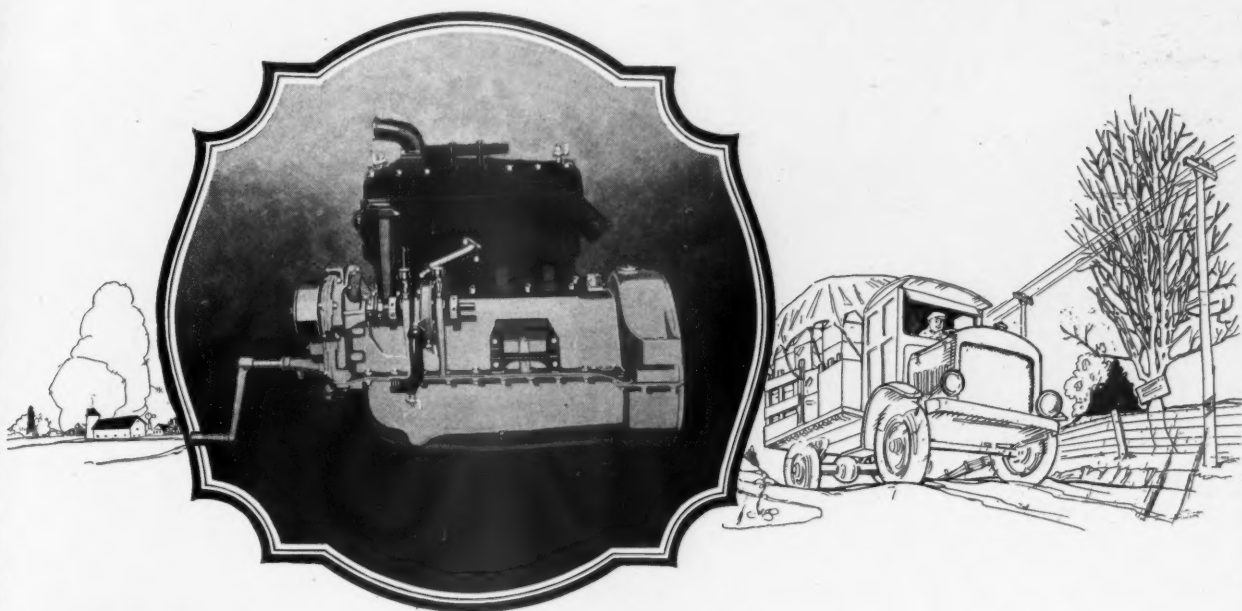
voting \$60,000,000; Pennsylvania, \$50,000,000, and Washington, \$33,000,000.

Colorado is one of the few states working convicts upon her public roads. Work of this nature was started in 1899, through a bill introduced by Sen. T. J. Ehrhart. Later, Sen. Lewis introduced a bill in 1905, which passed, and under which convicts are being successfully worked. Privileges and better surroundings are proving a great incentive to prisoners to improve their conditions while serving their sentence, and also to shorten their terms. The present warden, T. J. Tynan, took charge in 1909, and has extended and developed the system until it is one of the very successful adjuncts to the state's system of road work.

To further prove what a valuable asset a state's highway can become, it might be interesting to review a few government figures on what the automobile has done to increase farm values in the United States. During the twenty years prior to the end of 1900 the increase in farm values averaged \$400,000,000 annually. During the same time the population increased, roughly, 50 per cent., or $2\frac{1}{2}$ per cent. per annum. The increase in farm values in the sixteen years following (these are the latest figures available) average \$1,300,000,000 a year, over three times as much as in the pre-automobile period. The popula-



Building Roads Over Precipitous and Dizzying Heights Like This, While Sometimes Rather Expensive and Always Difficult, is Not an Uncommon Occurrence in Colorado. This Shows a Portion of the Durango-Silverton Highway, Colorado, Which is Partly Completed



Buda

TRUCK *and* TRACTOR



Engines

Nineteen months of war did for the Buda Engine what ten years of ordinary usage could never have done—it conclusively proved Buda's ability to deliver constant, heavy-duty power under all manner of transportation conditions.

Buda has become the truck and tractor dealer's biggest selling asset. You can get a Buda—insist.

Write for "Superior Engine Service"—a book
on sensible engine operation. Send
10c to cover postage if you are
not a Buda owner

The Buda Company, Harvey [Chicago Suburb], Illinois



Putting the Finishing Touches Upon a Stretch of Concrete Highway Near Denver

Convicts are being successfully worked in road building, and are granted additional good time allowance upon their sentence

tion increased during the same period 33 per cent., or 2 per cent. per annum. While the population increased in twenty years 50 per cent. and farm values 57 per cent., or 3.35 per cent. a year, the population in the following sixteen years increased only 33 per cent., and the farm values 100 per cent., or 6.25 per cent. a year. The percentage of increase of population fell off 17 per cent., but farm values gained 33 per cent. in the sixteen year period, when automobiles and trucks were extensively used.

To what extent will the betterment of the highways further advance the value

of farms when improved to a degree where travel by automotive transport will be cheapened to a minimum? From the viewpoint of the consumer the outlook may not be so roseate, for the cost of his necessities of life have advanced beyond reason. This advance may be excused by the very abnormal conditions the whole world has endured for the past four years. Surely when the readjustment comes the level of prices can be gratifyingly lowered through the improvement of road conditions to where the marketing of commodities will be made more economical.

A Large Des Moines Company Changes to Truck Pneumatics

Convinced that bigger profits and more satisfactory truck service may be obtained by the use of pneumatic tired trucks in handling its transportation work, the C. L. Percival Company, of Des Moines, Ia., manufacturers of refrigerators, etc., is gradually eliminating cushion tires from its fleet and will soon be 100 per cent. pneumatic.

To date, it has equipped two of its eight trucks with pneumatics. A G. M. C. 1½-ton truck has been fitted with 36 x 6 front and 38 x 7 rear pneumatics of the Firestone make, and a two-ton Autocar has 36 x 6 Goodyear pneumatics all around.

"Our trucks run faster and do better work in every way," says W. H. Percival, who has charge of their work. "We have a great deal of country driving to do, and, when our trucks slip off the road



A GMC Truck Belonging to the Percival Company. Firestone Pneumatic Equipped

into the soft mud, I want to know that they will get back again, which they do with the big pneumatics on them. The use of the pneumatics has shown a very appreciable reduction in our truck repair costs. While we now have only two trucks so equipped, it is a matter of time when our other six trucks will give way to trucks with pneumatic tires. We want to bring this about as soon as possible as a matter of business economy."

Interesting Talks With Dealers

"I have found that a good way to sell trucks to the farmer is to take your demonstration truck right out where farmers are gathered together, at threshing time, or at a sale, or at an institute, any place where there's a crowd of them." So says C. E. Keyes, of the Iowa Truck and Tractor Co., of Des Moines, who handles the Rainier, Panhard, and Sterling lines. "I have sold the Panhard mostly among the farmers out here," continues Mr. Keyes. "When they're threshing, for instance, I drive out along the roadside where they are at work and just sit tight till, say the noon hour, or until they have to stop for something or other. Always they will stroll over, begin to look the machine over and begin to ask questions.

"Bill, there's a truck you ought to have," says one.

"Oh, no, you're the one that ought to have it," retorts the other, and first thing they know they really begin to want the machine very much. Of course I help the wish along by telling them what it will do for them, how it will help them boost their bank account, etc.

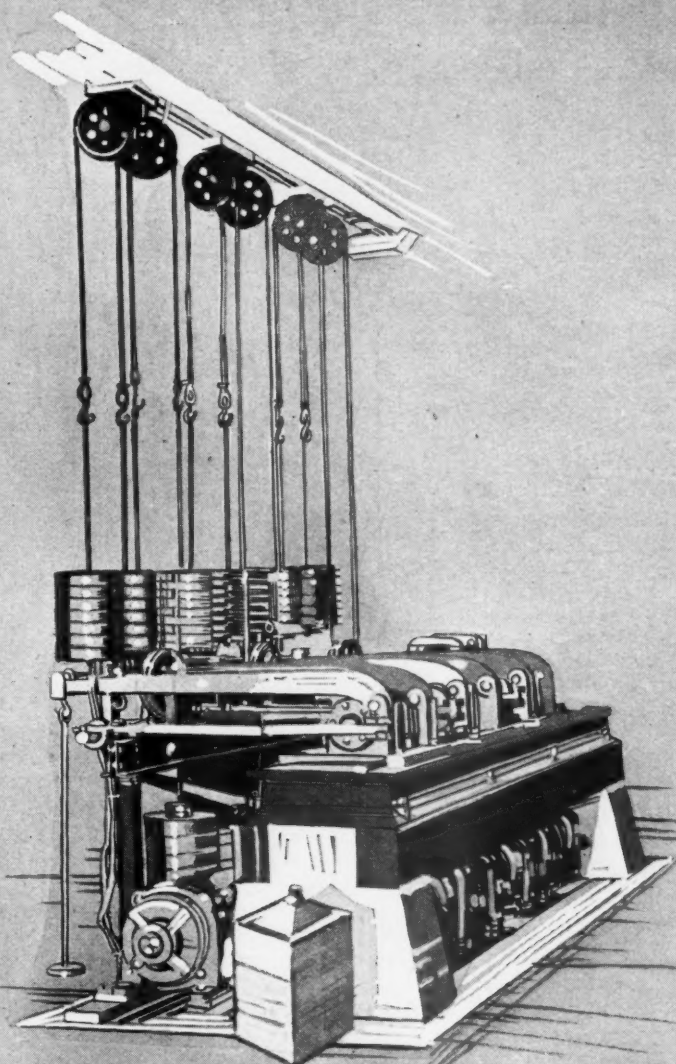
"And if possible I get them all to take a ride in the truck, maybe up to the house at noon for dinner. And I always stay for dinner. If invited, slip the old farmer's wife a good price for her meal, and tell her how good it was. It always pays, you know, to get the women of the household on your side. They count.

"After dinner the men gather around again, for they are very much interested in trucks out our way.

"I have made many sales of trucks just this way, for nothing convinces a farmer better than showing him that you have the goods that he wants. Take them to him, don't wait for him to come into your sales rooms. If you do the other fellow will beat you to your prospect.

"Another thing, I believe in the salesman specializing on one make of truck or passenger car. The same man trying to sell several different makes of cars or trucks at the same time is not a success, to my way of thinking. He can do better concentrating all his efforts on one type, learning everything possible about it and devoting all his energies to its sale."

Seven Packards Move Bosch.—The entire office equipment of the American Bosch Magneto Co. was hauled from New York to Springfield, Mass., in 20 hours on seven Packard trucks. The trucks left New York late Friday afternoon and arrived at Springfield just before noon on Saturday.



Where two years equals
five minutes

YOU can't measure the life of a Hess-Bright Ball Bearing in service—because Hess-Brights invariably outlast the machine of which they are a part. Yet from each lot of Hess-Bright Ball Bearings, several are taken at random and in this machine are run under heavy loads and excess strain for long periods of time—meeting tests greater by far than any met in service. It is in this way that we estimate the life of a Hess-Bright Ball Bearing.

And so it is all through the making of Hess-Bright Ball Bearings, where a score of tests are but natural processes of production.

This persistent care in manufacture has given Hess-Bright a deeper significance, not merely as the name of a product but as a mark or brand of service.

HESS-BRIGHT MANUFACTURING COMPANY
PHILADELPHIA, PA.

HESS-BRIGHT

"THE HALL MARK OF QUALITY IN BALL BEARINGS"

The Success of a Co-operative Truck Line in Short Distance Hauling

Great Dependence Placed in Motor Truck Transportation in Chicago and Vicinity

WHAT is believed to be the first co-operative motor truck freight line in the United States has been organized in Chicago. Eighty men representing business interests in Chicago and its vicinity, formed The Western Truck Lines. It is a co-operative venture and there is not a share of promotion stock within the organization.

It was found to be practically impossible to transport by rail the vast amount of freight that was consigned to the railroads last spring and summer. This condition led the manufacturers to the organization of the motor truck line as an auxiliary to the over-burdened railroads. Daily schedules were started between Chicago and West Chicago, early in September. Shortly after schedules were extended and freight stations were opened at Aurora, Elgin, Batavia, Geneva and St. Charles. At present the longest haul is 52 miles one way.

The motor truck line has now been in operation a sufficient length of time to convince thoroughly its promoters and patrons of its merit, both as a profitable investment and as a medium for quick and economical shipment of goods. It is giving a freight service much speedier than is possible by any other form of transportation. Frequently freight that, if consigned by other carriers, might be days in transit, is placed in the hands of manufacturers within a few hours from time of shipment.

Railway precedents have been followed, in so far as they have been found of advantage in the operation of the Western Truck Lines. A terminal station or depot, has been established in the heart of Chicago's shipping district at Clinton and Polk Sts. All trucks load and unload at shipping platforms arranged in station order. Depots are located in all

cities through which the trucks operate. Each depot is in charge of an agent who renders a service for the truck line much similar to the duties of a local freight agent.

their plant at Aurora, a number of large machines, which, naturally, were of value to them, only while in operation. The machines were loaded on trucks of the Western Lines at the close of the day's



White Five-Ton Units Are Used Exclusively by the Western Truck Lines
On the road west of Chicago

All trucks are operated over established routes but delivery of shipments and pick-up of shipments from and to points other than depots in Chicago and towns west, are made at regular published rates, the rates being based upon actual service rendered on each specific shipment.

White trucks are used exclusively. They are all five-ton units, fitted with bodies best adapted to highway transportation service. Comfortable cabs protect the drivers during the severest weather. Only the most skilled operators are employed, thus insuring "on-time" schedules.

Advantages Are Many

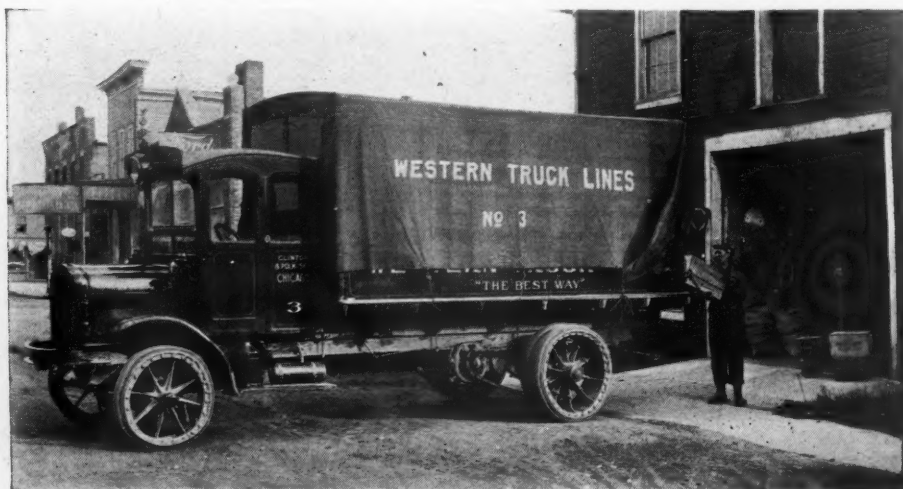
The Independent Pneumatic Tool Company, of Aurora, found it necessary to ship from their Chicago factory to

business in Chicago and delivered to Aurora, a distance of 42 miles, before the Aurora plant opened for work the following day. There was no loss of time through the machines standing idle.

Retail grocers have found that, by using this service, they save in time from five to ten days in getting their goods from the wholesalers. A further saving is effected by the elimination of petty losses through damage in shipment. Shipment by truck also insures fresher stocks.

Among the first to take advantage of motor transportation were the farmers. Those farmers using this service along the routes traveled by the trucks erect small platforms at the side of the road, placing on the loading platforms produce for shipment properly marked. The first truck along picks up the consignment and delivers direct to the best market with no loss of time from work on the part of the farmer.

The company has handled thousands of shipments and has yet to receive the first complaint. Concerns entrusting the line with trial shipments have, without a single exception, become permanent patrons.



Depots Are Located in All Cities Through Which the Trucks Operate
Truck unloading consignment of goods at Aurora station

Extinguishing and Preventing Oil and Gas Fires.—The Bureau of Mines of the Department of the Interior has recently issued bulletin No. 170, under the foregoing title, by C. P. Bowie. It contains 48 pages, 19 plates and 4 figures, and will be interesting to many in our field. Copy of the publication can be obtained gratis by writing to the Director of the Bureau of Mines at Washington, D. C., ordering the publication by number and title.

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TABLE OF CONTENTS

	Page
Advertisers' Index	301
Commercial Car Specifications	36
Editorials	23
Efficient Repair Methods	32
Equipment and Appliances	51
Factory News	34c
M. T. A. Activities of Philadelphia	92
New Agencies	34c
New Commercial Cars	46
News of the Trade	19
Personal Items	34a
Prominent in the Commercial Car Industry	31
Removals and Trade Changes	34b
Steel and Rubber Markets	94

SPECIAL ARTICLES

Dealer Gets Real Facts of Rural Motor Express	7
New York Dealers Establish Motor Truck Exchange	11
National Motor Truck Sales Managers' Meeting	13
Motorization of the Farm	16
Future of the Tractor on the Motor Truck Industry	17
How to Obtain Export Information	29
Stock Yards Prefer Cattle Hauled by Truck	35
Government Collects Reconstruction Information	70
Mr. Farmer Needs Your Motor Truck	72
Systematizing Spells Success for Trucking Company	76
Government Survey of Motor Truck Routes	82
Trailers Successfully Handle Distribution of Bread	84
Motor Trucks Engage in \$9,000 Hauling Contract	88

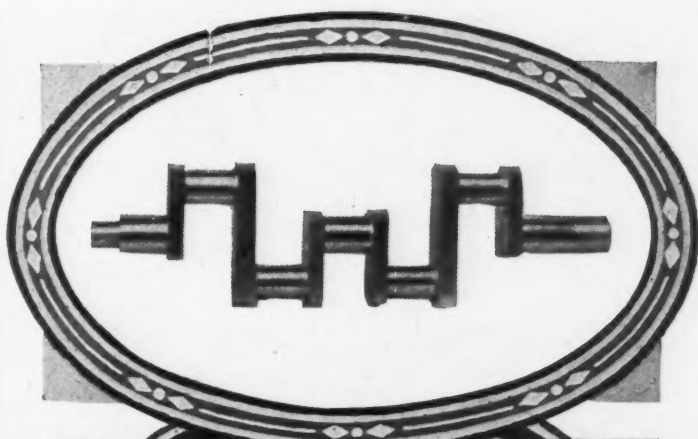
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Canada	2.00
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WYMAN GORDON

The Final Cost

The WYMAN-GORDON practice of straightening, centering and accurately marking all crankshaft forgings for machining not only reduces the finishing expense, but greatly increases production; and, therefore, materially reduces the final cost of your crankshaft.

Our Engineering and Metallurgical Departments are at your command.

WYMAN-GORDON CO.
"The Crankshaft Makers"
Worcester, Mass. Cleveland, Ohio



GUARANTEED FORGINGS



THIS Autocar of J. J. O'Brien & Sons took the place of three teams. Now three more Autocars have been added, representing just so much increased business brought within reach of one store. Over city and rural routes Autocars are adding daily to the profits of thousands of business houses such as J. J. O'Brien & Sons and the J. E. Linde Paper Co.

Designed to carry the paying load at the lowest possible cost

THE motor of the Autocar is placed under the seat to do away with excessive overhang—to distribute the load evenly over all four wheels.

This equalization of load diminishes wear and tear on tires and truck. It allows of lighter construction, so that less power is needed to move the weight of the truck and more is available to move the paying load.

And the shorter wheelbase thus achieved gives the Autocar its extraordinary ease of handling, even in narrow streets and cramped quarters, where motor truck operation would seem impossible.

The fact that half the Autocars sold are repeat orders from the 7000 Autocar users is convincing proof of Autocar performance

THE AUTOCAR COMPANY, Ardmore, Pa. Established 1897
The Autocar Sales and Service Company

New York	Boston	Philadelphia	Chicago	Pittsburgh	San Francisco
Brooklyn	Providence	Allentown	St. Louis	Baltimore	San Diego
Bronx	Worcester	Wilmington	Atlantic City	Washington	Sacramento
Newark	New Haven			Los Angeles	Fresno

Represented by these Factory Branches, with Dealers in other cities

Autocar

Chassis
\$2050